THE ENGINEERING AND MINING JOURNAL

COAL

Entered at the Post-Office of New York, N. Y., as Second-Class Matter.

VOL. XLVIII. JULY 27. No. 4.

RICHARD P. ROTHWELL, C.E, M.E.
ROSSITER W. RAYMOND, Ph.D., M.E. } Editors.

Cable Address: "Rothwell," New York.

Books for review and all communications for the JOURNAL should be addressed, Managing Editor, P. O. Box 1833, New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND, P. O. Box 1465, New York. Articles written by Mr. Raymond will be signed thus *; and only for articles so signed is he responsible.

London Office: Finsbury Chambers, 76 Finsbury Pavement, London, E. C. Mr. Thomas B. Provis, Civil and Mining Engineer, Manager.

Mexico: Mr. R. E. Chism, M. E., Callejon Espirito Santo No. 4, City of Mexico.

Peru, South America: Mr. John Newton, No. 2 Calle Constitucion, Calla.

Australasia: Messrs. Moffat, Judd & Co., 11 Bridge street, Sydney, N. S. W.; Mr. J. T. Partridge & Co., 134 Manchester street, Christchurch, New Zealand; Mr. W. Forster, 56 Elizabeth street, Melbourne, Victoria.

SUBSCRIPTION PRICE, including postage:

Weekly Edition (which includes the Export Edition), for the United States, Mexico and Canada, $4 per annum; $2.25 for six months; all other countries in the Postal Union, $5.

Monthly Export Edition, all countries, $2.50 gold value per annum.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO. All payments must be made in advance.

FILE COVERS will be sent by mail for $1.00, or delivered at office for 75 cents each.

THE SCIENTIFIC PUBLISHING CO., Publishers,
SOPHIA BRAEUNLICH, Sec'y & Treas. R. P. ROTHWELL, Pres. & Gen'l Manager
P.O. Box 1833. 27 Park Place, New York.

The Table of Contents will be found at the end of the reading matter, page 85.

AN eight-page supplement, containing an installment of Howe's "Metallurgy of Steel," accompanies this number of the ENGINEERING AND MINING JOURNAL.

THE New York World's Fair for 1892 may be said to be well started. At a large and enthusiastic meeting, by the mayor's invitation, yesterday, resolutions were adopted warmly indorsing the suggestion, and it now seems certain that the project will be carried out, we trust, in a manner to reflect credit on the whole country. The mining, metallurgical and other engineering industries will undoubtedly contribute largely in making this World's Fair worthy the study of the experts of every country, and it will place American engineering before the world in a fitting manner.

THE ANGLO-AMERICAN SALT COMBINATION.

It is now certain that the public is by no means so anxious to buy the securities of the North American Salt Company as its sanguine promoters expected. The exact amount subscribed here, outside of the one-third which the vendors of works are to take in stock, has not been made public, but it undoubtedly was small, and did not at all cover the amount of stock and bonds offered.

Information we had received a week ago stated that $5,000,000 had already been subscribed privately in England. This, however, seems also to have been somewhat overestimated. The New York *Herald* of the 26th, in a special dispatch from London, says:

> The subscriptions to the North American Salt Company closed here to-day. The shareholders—which means the English Salt Union—subscribed £663,000, and the public £510,000. These figures were secured from one of the promoters, who wondered how the American public was buying. It is considered curious by shrewd business men that the promoters of the company did not give an inkling of the profits of salt-making in the States and Canada. The prospectus simply sets forth one point, that of revenue: "It is believed that with improved methods the average net profit of four cents a bushel can be relied on." Such profit on ten million barrels would give £400,000 on £3,000,000 of capital, the prospectus states, but not a word about past profits.

This, in connection with the comparative failure of the subscription here, would indicate some uncertainty as to the enterprise going through. The reports cabled here yesterday morning—apparently with the hope of stimulating subscriptions—that in England the shares were quoted at 17s. 6d. premium, were, of course, without foundation. The English have not subscribed what was expected from them, and if they wanted more they could get it at par here without difficulty.

ENGLISH INVESTMENTS IN AMERICAN MINES.

It would be well if English investors in mining ventures in this country gave heed to our warnings when we go out of our way to criticise those schemes that are placed upon the London market. When we do so, we have two objects in view, viz., the encouragement of the mining industry, by trying to keep it clean and honest, and a sincere desire to protect innocent people from the evil designs of knaves. It must be borne in mind also that any unfavorable comments that we feel called upon to make are based on actual knowledge of the facts, sometimes specially obtained with care and trouble for the very object in view.

In our issue of October 20th of last year, under the title of Mine Promotion in London, we called attention to the overvaluation of the mines on Little Ella Hill, near Leadville, then recently sold, or proposed to be sold, to the Leadville Mines, Limited, of London, and we pointed out the insufficient working capital left after providing the enormous purchase money of $1,000,000. Results have proved that we were fully justified in our remarks, as the directors of the company declined to complete the purchase on the ground of misrepresentation.

In the same editorial we remarked upon the apparently fair terms of sale of ex-Governor TABOR'S property on the Vulture Lode in Maricopa County, Arizona, and at the same time on the unsatisfactory nature of Professor BLAKE'S report upon the ore in sight, and upon which the deal was largely based. This, too, has apparently ended disastrously, although by the conditions of purchase—which on the face was nothing more than a six months' option—no liability or risk to the subscribers was involved until the directors had satisfied themselves of the value of the property, it appears now that the shareholders are in trouble, and are having assessments made on them to enable the directors to keep the mine free of water, the costs for which the vendor had agreed to defray. The prospects of the stockholders getting back their money do not appear promising; in fact, the personal element has a good deal to do with the value of the mine, and it is sometimes, if not always, wise to fear the Greeks, even when bearing gifts.

FASHION IN THE USE OF DISINFECTANTS.

Ten years or more ago the discovery of salicylic acid was heralded with great applause, and a means by which all infection could be prevented seemed at last to have been found. It was claimed to stop putrefaction, and its use for the preservation of food was suggested and adopted on a small scale. In course of time it has not only fallen into disuse, but the French government, at least, has gone so far as to prohibit its use for the protection of food. The sanguine expectations of its admirers were far from being realized. Next copperas (iron sulphate) was rediscovered, and its use was recommended by the National Board of Health. Then KOCH, of Berlin, announced the remarkable efficiency of mercuric chloride, and it continued in fashion until STERNBERG and his followers found that the good old-fashioned chloride of lime was "sure death" to microbes. Each one of these most valuable agents, as well as many others, has had its worth experimentally demonstrated by its advocates, among whom were able chemists, and its efficiency testified to by equally competent practitioners. The truth seems to be that of the numberless, simple and compound disinfecting agents which have been from time to time proposed, a great many have undoubted utility in special cases, a few are practically inert, and a less number have been absolutely harmful because applied without discretion. But the trouble is that too much is expected of a single agent. One disinfectant may successfully oppose a certain class of germs or a particular kind of chemical decomposition and recomposition; it is therefore pushed before the public as a sort of cure-all, and when it fails under conditions to which it is not suited there is a reaction of sentiment, and its legitimate function is lost sight of. The enthusiastic investigator, who has just finished some successful experiments with a new agent or new applications for an old one, is a little apt to become infatuated with his favorite subject, and in presenting the results of his discoveries make the claims a trifle too broad. Then it is taken up by physicians, health officials, and the press, enlarging as it travels, like rumor, until the scope of its value is made well-nigh universal. On the other hand, the revulsion in case of partial failure often results in too sweeping denunciation. It seems strange that personal feeling and that queer mania of ours for change, called fashion, should hold such potent sway in so prosaic and practical a matter.

COPPER PRODUCTION IN CHILI.

The production of copper in Chili has fallen off from more than 49,000 gross tons in 1879 to little more than 29,150 in 1887, and although a renewed activity was imparted to the industry by the high prices of last year, and a slightly increased production (31,240 gross tons) was the result, yet if we are to judge from the picture drawn by the journals of that country, which presents a most depressed condition of affairs, the returns for the present and coming years will show a considerable further reduction. It is stated that there are 15,000 fewer miners at work in mines this year than last; in consequence of the closing down of copper mines, and most of the men have found occupation in railroad construction and other public works. This must mean a decrease in the production of copper, and such discouragement from the severe loss entailed upon the mine owners

that it will be a long time before native capital is again embarked in copper mining.

The decrease in the actual production will not be so great as would be naturally assumed from these figures, for a large amount of the work done last year was dead work in reopening mines that had not been worked since the good old days when Chili bars sold in London at £70 and £80 a ton without the aid of a "corner." These mines had scarcely been put in a productive condition when the crash came, so that the unfortunate owners have had all their outlay without any return. The history of copper mining and smelting in Chili has been that, unlike that in most other countries, it has been carried on chiefly with native enterprise and capital, in place of being exploited by Englishmen and others of foreign nationality. This makes the losses felt all the more severely in the country, and the effects are likely to be so much the more permanent.

It is estimated that about 80 per cent of the copper hitherto produced in Chili has been obtained from working low grade or comparatively low grade ores from mines that can not pay wages, much less a profit, with Chili bars at £40 in London. Many of them, indeed, would have a struggle to keep open with the price £10 a ton higher. Under the present prospect of low-priced copper for years to come, it would seem that Chili must become less important as a factor in the world's production.

The Chilian people are, however, miners by nature, and we should not be surprised if the blow to the copper industry should result in developing the gold mines of the country. And the development of the railroad system will also greatly reduce the cost of transportation on supplies and metal, so that the cost of production will be greatly reduced in some cases. Moreover, Bolivia, which up to the present time has been out of the lists as a copper producer, except on its Coro Coro ore, is known to possess immense copper deposits, which before many years will be within the reach of railways.

Whatever may be the prospect of an advance in prices from the exhaustion of existing mines and the incredulity as to the finding of others equally rich, there can be no doubt of the statistical fact that all the metals have declined in prices as years went by, and it may safely be predicted that the general tendency of the markets is always down toward lower figures, for the costs of production and marketing are steadily declining.

LIABILITY OF TRUST CERTIFICATE HOLDERS.

The growth of the trust epidemic is casting a very portentous shadow over many industries, and will, undoubtedly, bring disaster in its train.

It is perhaps useless to oppose any abuse which brings large profits, even though they be temporary, to investors, but the duty of an honest friend is to point out the truth, even if unpalateable, and being very desirous of promoting the permanent prosperity of the great industries the ENGINEERING AND MINING JOURNAL represents, it would be a betrayal of our trust were we to remain silent while schemes are being floated which must ultimately tend to discourage investments in legitimate mining, metallurgical, and manufacturing enterprises.

Progress, the world over, is becoming so rapid that the works and appliances of to-day are quickly superseded and rendered valueless by new improvements, and antiquated works find the struggle for existence becoming more and more severe. It is, no doubt, natural that many of these works which find their balance sheets in an unhealthy condition, notwithstanding economies in administration, should catch at straws in the form of combinations and trusts to extend somewhat the existence whose survival is threatened.

Every one knows how these combinations operate. Their object is to increase the selling price so as to enable even antiquated or unsuitable works to make a profit, and as overproduction was the cause of the low prices which brought them to the verge of bankruptcy, they have to curtail production; this in its turn increases cost of production, and the price has to be further advanced to cover it, and so the bubble grows until its final collapse, which invariably leaves the trade in a worse condition than before the combination was inaugurated.

The duration of the combination is generally greater the more completely it controls production, and the more able it is to strangle competition. In order to get all the producers to join promptly it is necessary to offer great inducements, such, for example, as giving them the value of their works in cash and a large stock bonus, as in the new anglo-american salt combination; or by taking over their works at four times their liberally estimated cash value as in the case of the Lead Trust.

Then, of course, the public are called upon to provide at least "a moderate interest" on the capital, even though three-fourths of this is "water." Those who invest in combination stocks or trust stocks with the expectation that works which cannot pay any fair dividend on actual cash values can pay large and permanent profits on three or four times this, by simply combining them or putting them in a trust, will not only inevitably lose their money, but they subject themselves to risks such as no prudent investor should assume. Combinations to restrict trade or enhance the prices of articles of necessary consumption, such as salt, coal, etc., have many times been declared by our courts to be illegal, and, should judgments be obtained against them by those whom they injure, it is not certain that the individual stockholders might not be held liable.

In the case of trusts there can be no question whatever upon this point. Trusts, as we have already stated in these pages, are attempts to wield associated capital on an enormous scale without responsibility to the laws made to regulate such association. They have no stockholders in a legal sense—only "certificates of trust," entitling the holder to whatever the trustees choose to give him, whether of dividends or of information. Hence they have no stock to be taxed, no reports to make to anybody, no officers to be prosecuted for violations of law—in short, they would seem to incarnate power without responsibility.

But it has been well settled that *trustees and holders of trust certificates alike are unlimited partners, jointly and severally liable for all acts of the association.* There, is therefore, a clear legal remedy for all wrongs they may commit.

The injury which trusts may do to their rivals in business and to consumers may thus be brought home to any individual holder of trust certificates, and he may be made to pay the damage. This is a prospect that should certainly cause investors to hesitate before parting with their good money in the purchase of such unlimited liability.

THE MEANING OF THE INSTRUCTIONS FOR THE ENTRY OF SILVER-LEAD ORES.

Last week we commented on the new rules instituted by the Treasury to govern the admission of silver-lead ores from Mexico, and we pointed out the ambiguity and impracticability of some of the instructions given. On their face these seemed to be solicitous not to interfere with the legitimate businesses based on the free entry of ore, but aimed simply to prevent improper mixing of ores with the view of avoiding the payment of duty on the contained lead. As we anticipated, the meaning of the instructions is everywhere a subject of dispute; they are, indeed, far more ambiguous than the law itself, the meaning of which they were supposed to elucidate. The more these instructions are studied the more obscure they become; but some facts become more and more clear; that either they were cunningly intended to prevent the entry of nearly all ores while nominally not changing the law, or, as we incline to believe, they were made with an amazing amount of ignorance of the trade to which they refer.

We have already pointed out that Clause 2 provides that "the importation embraces no mixtures of ores or concentrates from different mines," a condition usually not within the knowledge of the importer, and one which, if it could be enforced literally, would keep out a great part of the ores which now come in, for even the mixture of ores which, separately, could enter free, is prohibited. Neither has the importer frequently any knowledge of the mine from which the ores he buys originate. One would suppose that if the ore coming into the country be such as to entitle it to free entry, the control of our government over it would cease, for it is doubtful if it could say to the Mexicans, You may send your ore from one mine in free, but precisely similar ores from two other mines, worked together, cannot be admitted.

We reprint these instructions in order to give our readers the opportunity to elucidate, if possible, their meaning, and ascertain how they can be applied in practice, "without difficulty or hardship," as Secretary Windom believes will be the case:

1. The sworn entry shall embrace, in addition to what is now required, a statement of the estimated quantities and values of silver and lead contained in the importation, according to the best knowledge and belief of the importer or consignee.

2. The entry shall further contain a declaration that the importation embraces no mixture of ore or concentrates from different mines.

3. The entry shall also disclose the name and locality of the mine from which the ore has been taken.

4. Upon the arrival at the frontier of cars or other vehicles laden with ores containing an appreciable quantity of lead, they shall be locked or otherwise secured until entry be made and permit granted to unlade.

5. Upon the unlading, and at the time for unlading, the officer of the customs assigned to that duty shall supervise the work, and shall obtain proper and adequate samples from those taken for commercial purposes by the importer or consignee; that is to say, they shall be taken in the manner approved and practiced by miners in the handling and reduction of ores, by thoroughly mixing and quartering every tenth shovel or more, repeating the operation until the usual commercial sample be obtained.

6 To avoid the detention and expense incident to the unlading and sampling at the frontier, in cases where the cars or other vehicles are destined to an interior port or place without so unlading, they shall be adequately inspected, and if in the judgment of the collector the ore is deemed to contain lead in quantity sufficient to make it dutiable, or if the legal classification be held doubtful, appraisement may be waived and entry made on an estimate of duties, and the goods permitted to proceed to destination under a warehouse and transportation bond, the entry to be ultimately liquidated under an appraisement based upon the samples selected in the manner above prescribed in paragraph 5.

It is suggested that in the execution of these instructions care should be taken equally not to unnecessarily detain ores wherein silver so clearly predominates as to fix their character commercially as silver ores, nor to admit without assessment of duty those ores wherein the value of their components of lead appear to exceed that of the silver contained in such ores. It is further advised that in determining the relative values of silver and lead contained in the same ore the value of the silver component, in the absence of more accurate data in the invoice or otherwise, be rated at 95 per cent of the latest known value of silver bullion in the New York market, and the value of the lead component at the latest known price of bar lead in the same market, less one cent per pound.

From the information before the department it is believed that neither difficulty nor hardship will result from the practical enforcement of these instructions, but

if any obstacle shall arise in their execution, you will please report the exact nature and extent of the obstruction, with your suggestions for its removal.

Clauses 5 and 6 require the sampling by shoveling and quartering of the entire shipment—a work necessarily involving a very heavy expense, even the invoice stating actual net price at which the ore has been purchased apparently would not obviate the necessity of this resampling unless indeed the clause means that the government sample is to be taken by sampling the importer's commercial sample. Clause 6 contains some curious provisions in which the judgment of the collector "is relied upon to decide whether the ore going inland contains lead in quantity sufficient to make it dutiable, in which case the ore is to proceed to destination in bond and then be sampled."

The collector should "not unnecessarily detain ores wherein silver so clearly predominates as to fix their character commercially as silver ores, nor to admit without assessment of duty those ores wherein the value of the components of lead appear to exceed that of silver contained in such ore," but what a marvelously penetrating judgment that would be which could tell without sampling and assay whether a silver-lead ore contained 10 or 1,000 ounces of silver. Take for example an ore carrying 30 per cent lead, if it contain 10 ounces of silver it would pay duty on the lead, and if it contained 100 ounces it would not, and without assay who can tell whether it contains 10 or 100 ounces? Ultimately the basis for duty rating will probably come to be recognized as the actual cost price of the lead in the ore, with the necessary checks on the accuracy of these invoices, just as is done with all other goods imported.

There appears to be much uncertainty as to the meaning of the official suggestions in the matter of the basis on which the relative values of the silver and lead are to be determined. The "suggestion" says: "The value of the silver component, in the absence of more accurate data in the invoice or otherwise, is to be rated at 95 per cent of the latest known value of silver bullion in the New York market, and the value of the lead component at the latest known price of bar lead in the same market, less one cent per pound."

If the basis of "the more accurate data" furnished "in the invoice or otherwise" is to be confined to getting at the value of the silver alone and not that of the lead, then the value of the lead is apparently to be taken at the New York price of pig-lead, less 1 cent per pound, or, at a price of 4 cents a pound for pig-lead the basis of valuation would be 4 — 1 = 3 cents a pound on the lead in the ore at the frontier, which is about twice its actual value. This figure for valuation in the past has been counted, we believe, at 1 cent a pound at Eagle Pass and 1½ cents at El Paso. The net price paid by the importer for the lead in the ore, after deducting freights and smelting charges, has been about 1½ cents a pound.

If, for example, we take an ore carrying 30 per cent or 600 pounds of lead per ton and 20 ounces of silver, which would represent perhaps four-fifths of the ore that comes in from Mexico, it would figure out as follows: 95 per cent of 20 ounces at 92 cents per ounce, $17.48; 600 pounds lead at 4 — 1 = 3 cents, $18. And this ore would be excluded (except on paying a duty of 1½ cents a pound on the lead), while in reality the actual price paid for the lead would have been only $9, and the duty would be 100 per cent.

We cannot accept the explanation made by some parties that these instructions were cunningly devised to exclude nearly all the desirable fluxing silver lead ores, while nominally not changing the ruling heretofore in force, nor can we believe that these instructions are sent only to the Mexican frontier and are not given to the collectors at the ports of entry of Canadian ores. A great government is far above such tricks and petty actions. No doubt the instructions were given in perfect good faith, but with more or less ignorance of the actual conditions of the business, and the many points in which they are impracticable or their meaning is obscure, can be rectified by further instructions, for it is specifically stated that "it is believed that neither difficulty nor hardship will result from the practical enforcement of these instructions," and the collectors are requested to suggest means for the removal of difficulties or hardships should they occur.

The practical working of the matter is in fact left to the collector, whose "judgment" is relied on as to the classification of the ores. We do not think it wise to leave so much to the "judgment" of officers, and would much prefer to see the instructions expressed so specifically and in such plain terms that all could understand their meaning.

NEW PUBLICATIONS.

THE ASSAYER'S MANUAL, AN ABRIDGED TREATISE ON THE DOCIMASTIC EXAMINATION OF ORES AND FURNACE AND OTHER ARTIFICIAL PRODUCTS. BY BRUNO KERL. SECOND AMERICAN EDITION, BY F. LYNWOOD GARRISON. Philadelphia, 1889: Henry Carey Baird & Co., 8vo., 354 pp., including index. Price, $3.

This second American edition follows the general style of arrangement of the earlier one, and a great part of the original text has been retained. The editor has, however, added many things which are new, thus bringing Kerl's classic treatise more nearly up to the times. The fire assay methods are but slightly changed, but in wet assay and especially electolytic assay so much progress has been recently made that considerable alterations are called for and have been made. A new chapter on tungsten, translated from Balling, and an article on the iron ore dry assay are among the additions.

Mr. Garrison has dropped the English weights and measures altogether and gives metric figures alone, furnishing conversion tables in an appendix. This simplifies the style, and is much less confusing than to present both systems side by side throughout. If all our analytical work is to be based on the metric system—and no one can doubt that this is inevitable—then, to hasten the universal adoption of the standard, it is necessary that all chemists and assayers shall be forced to think in metric figures, instead of using them in their work always with a mental translation into English equivalents in order to understand what they really mean. In wet analysis, of course, every one nowadays uses the metric system, but there are many assayers among those working on gold and silver fire assay who still adhere to the old methods, and who will not soon outgrow them, while in assay returns for commercial use there will, for an indefinitely long time, be the necessity of computing in ounces and tons.

The typography is excellent, the paper heavy and the binding strong enough for rough usage.

THE MINERALS OF NEW SOUTH WALES, ETC. By A. LIVERSIDGE, M. A., F. R. S. With map. London: Trübner & Co., 1888. Large 8vo. Cloth; 326 pp. Price not stated.

Although the imprint of this handsome volume bears date of 1888, it has only recently reached us from the publishers, and we therefore presume that its publication had been delayed.

Mr. Liversidge's name is familiar to the student of economic geology and mineralogy as that of a man who has done much to further the progress of these sciences, and also as one who has largely aided in the material development of the mineral wealth of New South Wales. His first paper on the minerals of the colony appeared in 1874. This was followed by a second and enlarged edition printed in the report of the Department of Mines in 1882. The present volume Mr. Liversidge modestly terms a third edition, but it is practically new, and carries the record up to the close of 1886 statistically. The book is not a mere catalogue and description of minerals, as its title might imply. It contains also much interesting historical and descriptive matter, among which the circumstances attending the discovery of gold in the colony and the finding of the celebrated big nuggets attract attention. The subject matter is arranged in two parts: 1, metallic minerals, gold, copper and tin taking the lead; and 2, non-metallic minerals, with coal naturally at the head. There is also an appendix containing some miscellaneous papers, in part reprints of articles out of print, and a list of mineral localities. In determining the minerals and giving them their exact locality Mr. Liversidge's work bears on its face the marks of conscientious care, and the map showing localities is well gotten up. There are a few illustrations. It is to be regretted that so valuable a book as this should be sent out without a general index, though the table of contents is pretty detailed. In point of typography, Messrs. Trübner & Co. are to be congratulated.

ELECTRICAL TRADES' DIRECTORY AND HANDBOOK FOR 1889. London: *The Electrician* Printing and Publishing Company. 8vo. 318 and ccxiii. pp Boards. Price, 3s. 6d.

This is a very handy reference book for those interested in electrical applications. It contains classified lists of manufacturers of electrical supplies, etc.; biographical sketches, news, statistical and a little technical matter, with some useful reference tables. In part the directory attempts to cover countries other than Great Britian.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

All letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

Platinum.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I would respectfully call your attention to the article on "Platinum Metals," on page 587 of the June 29th number of your publication. Speaking of the new platinum arsenide "sperrylite," the author of this article says that this mineral is "found to contain upward of 7.52 per cent of platinum."

Now, while this cannot be gainsaid, still it is misleading, as sperrylite in crystals contains 52·57 per cent of platinum, and a lower percentage would be due to gangue.

I append a copy of analysis of this mineral which appeared in the *American Journal of Science*, January, 1889.

Yours, LOUIS R. ALBERGER.

86 LIBERTY STREET, NEW YORK, July 22, 1889.

SPERRYLITE.

As	40·98	Pd	trace
Sb	·50	Fe	·07
Pt	52·57	SnO_2	4·62
Rh	·72		
			99·46

Mineral Waxes.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I am not surprised that your correspondent, Dr. Marcus Benjamin, should have found my view that the native mineral waxes are mainly made up of olefine hydrocarbons is not consonant with the teachings he has himself received and the authorities he has relied on. I myself, before entering many years ago into the special study of the subject, held the views he now holds, as I well remember. This furnishes one of the many examples of the perpetuation of obsolete ideas, from generation to generation, through text-books. Teachers rarely diverge, except in cases which they deem of leading importance, from the books they use in their classes. This special matter appears, to me at least, to be now assuming such a leading importance that I shall beg your consent to dilate further upon it in the course of a second article that I have for some time had in preparation, and hope that I may be successful in the conversion of your correspondent to what I look upon as the orthodox mineral-wax creed. Respectfully, HENRY WURTZ, Ph. D.

Movable Leaching-Trays.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The interesting articles on leaching which have appeared in the columns of the ENGINEERING AND MINING JOURNAL have suggested to me that its readers may find some service in learning a few accounts of a very simple method applied by the writer while treating a rather pasty ore with the Hunt & Douglas wet method in Georgia.

The plant with which the extraction was being carried on was of ordinary leaching vats, 6 × 7 feet, built roughly out of 2½-inch stuff. Not to incur further expense, I determined to utilize the plant as it stood, but at the same time to change the whole system of leaching by introducing a movable leaching-tray, which had been under my contemplation for some time. The tray in question was made from 2-inch stuff, and given special strength at its four corners for hoisting purposes, where 1¼-inch iron bolts, with eyes, were let into the corner posts, and held in place by round nuts at the bottom, which were plugged over to prevent the attack of the copper liquors. The vats being 6 × 7 feet (inside measurement) and 5 feet deep, the tray's measurements (outside) were 5 feet 3 inches × 6 feet 3 inches, and 3 feet deep, from top to bottom of the flange, which protruded 8 inches at an angle of 45 degrees from the lower perforated bottom of the tray, thus giving 1-inch play all round the flange when lowered into the tank; the tray when in position for leaching resting on 4-inch square blocks of wood at the corners and raised 2 feet from the bottom of the tank. A false bottom of 1-inch stuff, regularly perforated, over a good tight packing of 5 inches of mineral wool completed the filtering compartment of the tray. For the purpose of moving the tray to and from the bath, so as to remove all trace of copper. After which the tray can be bodily dumped; and in this particular another gain of time and labor is made.

In the event of trouble arising in works where the ordinary leaching-vats are in use, and in cases where it is desirable to obtain very highly concentrated liquors, such as in sulphate of copper manufacture, it will be seen at what a small additional cost the leaching system may be completely changed.

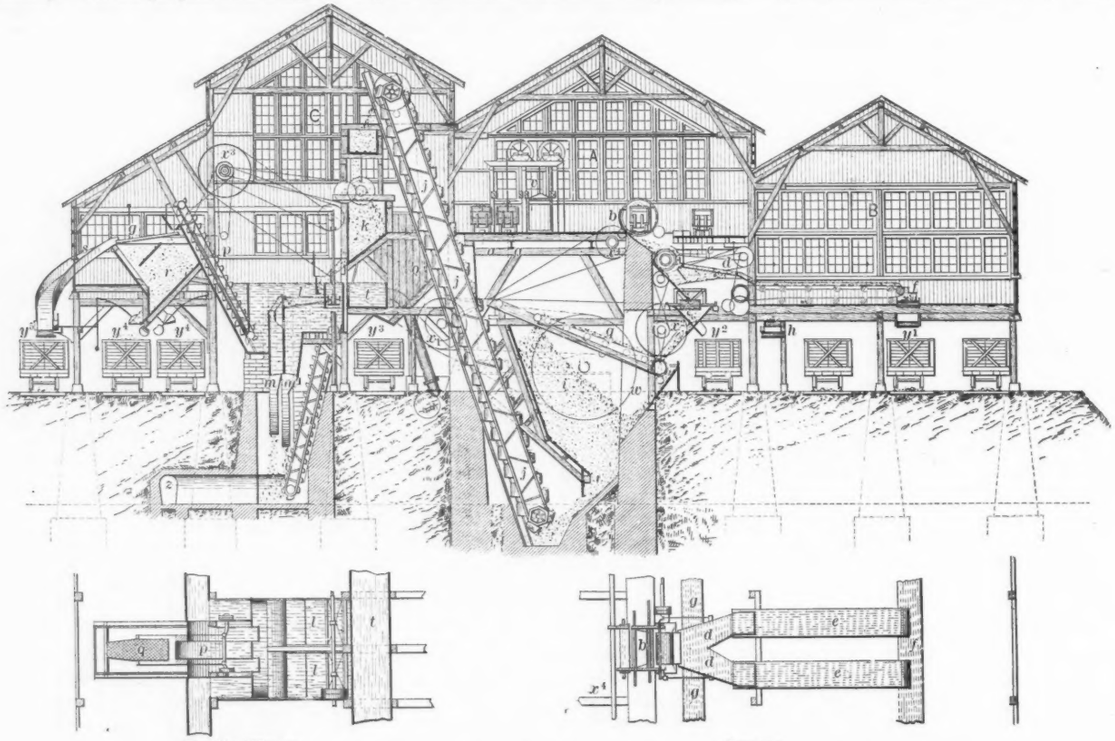
A tray such as has been described should be capable of treating 15,000 pounds of, say, 8 per cent roasted ore per twenty-four hours.

H. DOUGLAS.

COAL SCREENING AND WASHING AT COMMENTRY, FRANCE.

We illustrate the arrangements for handling and washing coal (borrowed from our contemporary *Le Génie Civil*) at Commentry, as being representative of the system in use in the best establishments of the kind in France. The company of Commentry-Fourchamboult has a capital of $5,000,000, and operates important iron and steel works in addition to the collieries at Commentry, the average annual output of which for the last eight years has been 504,000 tons.

The works for the preparation and washing of the coal are shown in Figs. 1 and 2, and by the aid of the following key the arrangements are clearly set forth. A, receiving building; B, screening building; C, washing building; *a*, mechanical hauling of loaded wagons; *b*, wagon tip; *c*, mechanical hauling of empty wagons; *d*, shaking screens; *e*, separating table; *f*,



Double Washer. Screens.

FIG. 1.—COAL SCREENING AND WASHING AT COMMENTRY, FRANCE.

tanks, I converted an ordinary 4-wheeled truck into what might be termed a drip-pan, by placing a shallow lead-lined box, which completely covered the wheels and iron work, and which was slightly larger than the tray. Thus, on removal from the bath-tank all drip was caught. A line of movable wooden rails in sections were laid on top of the tanks, connecting at one end with the furnace-house and at the other with the waste-dump.

When the tray was ready for charging, it was wheeled directly to the furnace-house, where it was filled to a depth of about 18 inches with the hot ore from the bin. The charging was completed in about ten minutes, care being taken to give the ore a uniform surface and depth. The tray was then run over the tank and slung by chains hooked on to the four corners. After slighting raising it, the truck was run from underneath, the section of rails removed, and the tray gradually lowered into the bath-tank. I found there was a tendency to "blow" as the liquor came in contact with the hot ore when the immersion was made too quickly, but with very little care in lowering this trouble was easily prevented. After allowing the charge to remain for about an hour in the bath, I found it advantageous to raise the tray to the surface, thus preventing the ore from becoming too compact, as the act of lowering again seemed to raise each particle as the liquor rushed in on it.

Experience showed me six hours' submersion was sufficient to reduce the soluble copper contents as perfectly as they could be boiled down by the same bath in the laboratory; and, so far as I was able to judge, I do not think that even by stirring the reduction could be more rapid. Where I found the great advantages in this method was in the quick means of charging, and gaining a perfect surface and uniform depth to the charge, thus securing the best means of obtaining a perfect leach. After the leach is completed the tray should be slowly raised out of the bath, for by so doing the powerful suction of the greater mass of liquor in the tank acts as a thorough drainer to the lesser, which is held in the charge, and the remaining moisture will be found comparatively small. Should the liquors be highly concentrated, it is as well to submerge again into a weak

cloth conveyer for large coal; *g*, cloth conveyer for fines; *h*, cloth conveyer for waste; *i*, raw fines hoppers; *j*, coal elevators; *k*, washer hoppers; *l*, washers; *m*, escapement passages for the dirt and slate; *n*, dirt and slate elevators; *o*, dirt and slate hoppers; *p*, washed coal elevators; *q*, washed coal screens; *r*, fines hoppers, slump and round coal passages; *l*, centrifugal pump and feed water reservoir; *u*, outlet cistern; *v*, fines hoist; *w*, fly-wheel of the engine; x^1, main transmission of power; x^2, screen transmission; x^3, washer transmission; x^4, wagon tip transmission; y^1, loading large coal; y^2, loading raw fines; y^3, loading dirt and slate; y^4, loading washed fines; y^5, loading lump and round coal; *z*, escape drain.

Fig. 2 presents the arrangement of the washer: *a*, raw coal hopper; *b*, hatch-gate of the hopper; *c*, distributing channel; *d*, lever and regulating screw of the gate; *e*, metallic washing table; *f*, lifting piston; *g*, post and tappet of the piston; *h*, counterpost of the piston; *i*, slate hatch-gate; *j*, dirt hatch-gate; *k*, control lever of the hatch gates; *l*, washed coal overflow; *m*, slate emptying sluice; *n*, dirt-emptying sluice; *o*, connecting rods and control levers of the sluices; *p*, feed water reservoir; *q*, communication between reservoir and washer; *r*, outlet cistern; *s*, washed coal buckets; *t*, shaking screen; *u*, fines hopper; *v*, lump and round coal passage; *x*, transmission of power to the washer; *y*, intermediate transmission to the screen.

Length of washing table	1·60 metres.
Width " " "	1·70 "
Incline per metre	0·03 "
Piston surface	1· "
Weight of piston and rod	658 kilos
Drop of piston, total	0·18 metres.
" " " effective	0·12 "
Number of blows a minute	36
Average delivery per hour of washed coal	15 tons.
Length of screen	2·50 metres.
Width " "	0·80 "
Number of double shakes a minute	185
Extent of shake	0·120 metres.

The slate is collected in one compartment with the slimes which pass

the washing table and which are very dirty. This mixture forms the total of the waste; it is got rid of by a sluice at the bottom. The fines suspended in the water can be saved with the coal by means of a sieve. Experience has established the fact that with the Commentry coal it is preferable to classify after washing instead of before.

GOLD AND SILVER IN THE OHIO VALLEY.

Written for the Engineering and Mining Journal by J. D. Whitham, M.E.

I find the following item going around the press: "The recent discovery of coal in Lower California has upset all geological theories that have been extant for a century." This finding of coal I take to be a fact, seeing it in some reliable journals.

Thirty years ago to-day, as the writer of this was on his way to the "Gregory Diggings," now Black Hawk, Colorado, near the foot of the hill, which Horace Greeley a few days afterward named the "Hill Difficulty," about fifteen miles northwest of Denver, indications of coal were observed. I had "Hitchcock's Geology" in my outfit, and concluded that the coal was very much out of place, or there was not much gold at the Diggings, and so remarked a California "forty-niner," but our theories were upset. When we arrived at Gregory a day or two later, we saw about a quart of gold dust taken out of a sluice box as a day's run for six men. From the Gregory lode, having ore in place, and from the coal in the valley, millions have been taken since. In fact,

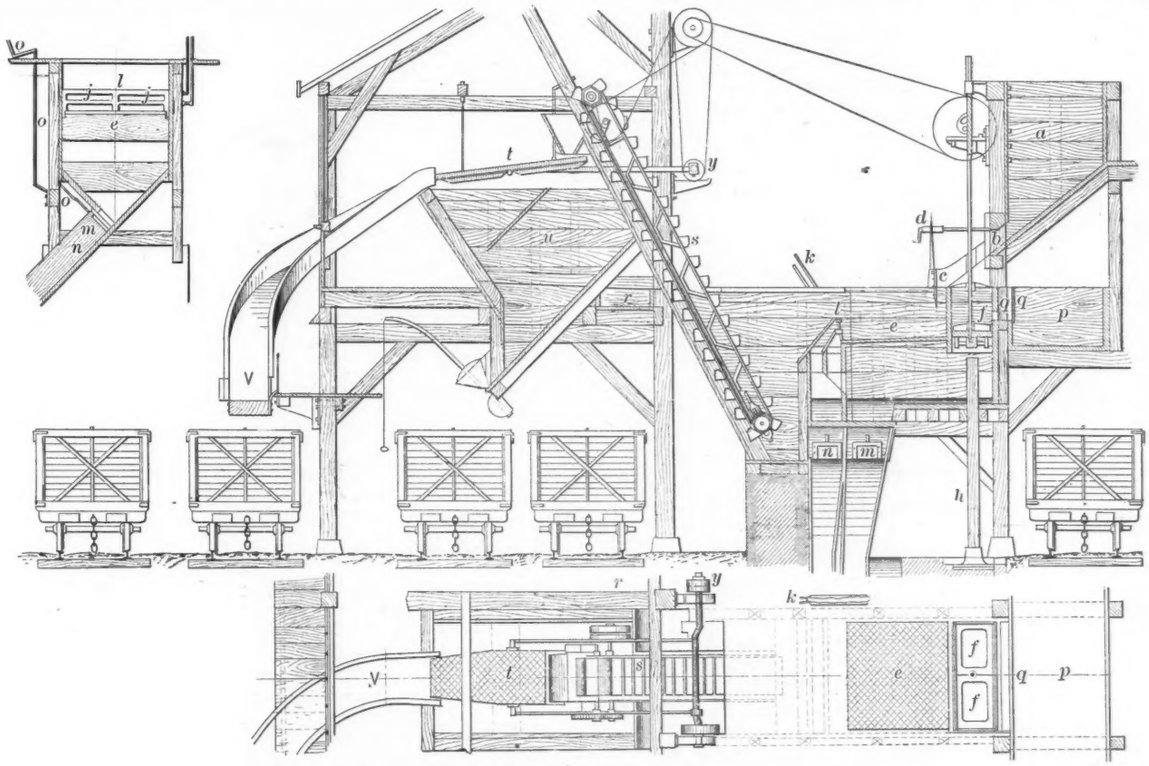


FIG. 2.—COAL WASHER AT COMMENTRY, FRANCE.

coal, gold and silver have been taken out of the same shaft in Colorado, until it has become a saying among miners: "Gold is where you find it."

Every now and then comes a report that gold or silver has been found in West Virginia in or near the Panhandle, where the strata are nearly horizontal, and in one stratum will be found coal and little deeper down or up, or indeed in the same stratum, will be found gold or silver.

The writer had the curiosity in a recent trip east to stop and see the formation and the rock from which it was alleged that the gold and silver came, got specimens of the rock in place, where there was no possibility of its being "salted," and they carried some gold and silver, and one sample had silver in paying quantities if found in large enough body, considering the cost of reduction in that section, labor, fuel, etc., being cheap. I only visited one point, that was in Ohio County, W. Va., about 10 miles east of Wheeling. The parties who have been experimenting for the past eight or ten years are farmers—they are spending their own money, have no land to sell. They say they have passed the experimental stage, have purchased from Frazer & Chalmers, of Chicago, a three-stamp pony mill, have it set up in connection with a grist mill, are using it to find out what kind of machinery they need.

It is asked, If gold and silver is there, why has it not been taken out long ago? Why are there no mines there?

Let us give a fact or two which the books lay down, and advance a theory or two, and then state why no gold or silver mines are worked in the section above-named, and many will exclaim: "Yes, that is so; I never thought of that before!"

When "stratas" were formed (excuse the Latin and English plural; it sounds better) they were level, and were built up by sediment from the sea water, which also holds in solution gold and silver which were deposited at the same time, but, it is presumed, not in all the strata, only in those where and when the conditions of precipitation were all right. Now, for the theory that gold and silver are found in strata lying level, what can be said?

The gold and siver mines of the world are mainly found in the mountain sections where there have been upheavals, breaking up of the earth's crust, and a great disturbance of the strata, exposing transverse sections or broken edges. Here the prospector for the precious metals finds it easier to discover mineral. Now, because found here, does this prove that it is found nowhere else?—not found in the strata which still lie level, or nearly so?

More theory. Many claim that when, by some convulsion of nature, earthquake, whatever that is, fire or chemical action, the strata were broken, the precious metals, either in liquid or vaporous form, came up, and were deposited where now they are. Others claim that the earth was covered by water, and void, and when the proper conditions came around, the water filling all the cracks in the earth's crust, veins, lodes, pockets, and chimneys, and even going out between the strata into the contact fissures, deposited the metal held in solution. Another theory is a mixture of both. That as the breaking up of the earth's crust was going on, the gold, silver, etc., came up in the form of vapor, and when the proper conditions arrived, air, water, chemical affinity, electric current, or whatever it might be, deposits were made. Will any one theory account for the various deposits of the precious metals? And are fact and theory both against their being found in the level lying strata?

The strata in which gold and silver are found in the West Virginia section lie *nearly* level, which indicates that there has been a "disturbance" of the earth's surface. Then is any theory against gold and silver in the Ohio valley?

The Pittsburg coal strata or veins, as called there, which crop out near the hill tops, are found many feet below the bed of the Ohio River at Wheeling, seventy miles off, a dip of the strata, showing a disturbance. In fact all through that country there are evidences of slight disturbances, and the trend of the breakage or seams in the strata run southwest and northeast, the same as the ore belts run in mining sections.

Any one seeing the rock, or shale, out of which the gold or silver is extracted in West Virginia, can not but be struck with the similarity of the shale, or slate, found in some of the western mines, particularly in the silver-bearing regions. Both are found to contain the precious metals accompanied with pyrites. In the western mines the theory is that it has been forced in by the upheavals; the same may be true in the case of the eastern deposits where the disturbance has been but slight and the deposits small. That is a question. Are they small? So far as discovered they are. In the North Carolina and Georgia gold sections, where upheavals have occurred, the deposits are also small. It is not where the greatest disturbances are, or where the mountains are the highest, that the largest deposits are. In fact, some of the largest deposits in the world have been found in low elevations Within seventeen miles of where I write $5,000,000 were taken out of the Lake Valley mines just a few feet under the ground. From a small elevation just at the edge of the valley, and within a mile of here, $340,000 were taken out from a short tunnel in the bank, with limestone all around and slate in close proximity. So, in reality, there is no theory against finding gold and silver in the coal regions of the Ohio Valley; but it is rather the other way, that they are there, must be there, according to all theory.

In that region the strata are exposed by erosion, valleys have been

washed out, leaving hills hundreds of feet high, on the sides of which can be traced the original formation—a chance for prospectors? Yes: but I would advise none of them to go there, better stay in the great West, which, as far as mineral is concerned, is simply scratched over, where it can still be found on top of the ground, and where the croppings and indications are much more plentiful, and where we are all certain that millions await capital and enterprise.

But instead of ridiculing the idea of gold and silver being found in the upper Ohio Valley region, people who spend their money in prospecting on their own lands should be encouraged. We hardly know what to expect next from that wonderful country.

As a farming region, it is not excelled, the land generally lying well, and covered with a rich soil which produces crops of grain and grass, as large as grown anywhere, and when in pasture, a blue grass sod is formed on which is grown wool, for fineness and texture unsurpassed, and beef and butter, which have a reputation everywhere for excellence of flavor. The whole underlaid with coal and situated properly for manufacturing centres, and as if this were not enough, Nature is giving up her best gifts to man in the shape of oil and gas—and what may we not expect next?

Whatever may be there, it is likely to be a long while before capital will invest in that country for the development of gold and silver, but these metals are undoubtedly there.

Sorel Stone.—Some years ago, M. Sorel, a French chemist, discovered that the oxychloride of magnesium possessed "hydraulic" qualities in a remarkable degree. This cement is the basis of the Sorel stone, and is formed by adding a solution of chloride of magnesium, of the proper strength and in the proper proportions, to the oxide of magnesium. The strength of this stone, as well as its hardnesss, is stated by Prof. I. G. Baker to exceed that of any other artificial stone yet produced, and it is claimed that it may, when desirable, be made equal to that of the natural stone which furnishes the powder or sand used in its fabrication. It is used mainly in making emery wheels. By incorporating large pebbles and cobble-stones in the mixture the stone can be made quite cheaply, and would therefore be suitable for foundations and plain massive walls if it could be made cheaply enough.

TWO EXISTING AMERICAN GLACIERS.

I. KONWAKITON GLACIER, MOUNT SHASTA.

When glaciers are referred to, the Mer de Glace and other famous glaciers of Switzerland, that were the field of some of the great work accomplished by Louis Agassiz and his friend Arnold Guyot, at once present themselves to the mind. There is abundant evidence of glacial action in the Eastern States, but for the glaciers themselves one must of necessity visit the Pacific Coast. One of those which have been examined scientifically is that on Mount Shasta, in northern California. This extinct volcanic peak is situated in latitude 41 degrees 24 minutes 30 seconds, and longitude 122 degrees 11 minutes 34 seconds. Its altitude has been determined by the cistern barometer to be 14,511 feet. It stands alone, and has no connection with neighboring mountains, none of which within a radius of forty miles attain two-thirds its height. The greatest length of its northwest slope, terminated by Little Shasta Valley, is sixteen miles. The southwest slope reaches Elk Flat, and descends over 10,000 feet in eight miles. The point where the timber growth receives its first check is at an elevation of 8,200 feet; the last tree, so diminutive as to hardly cover the palm of a hand, is found at an altitude of 10,130 feet.

KONWAKITON GLACIER, MOUNT SHASTA, CALIFORNIA.

Mount Shasta attracts attention at a distance of over 100 miles, and from nearer points the solemn repose and grandeur of its isolation are impressive. Clarence King ascended this mountain in September, 1870, and from his description we take the following account: The party climbed to the top of the lesser Shasta, a conical secondary crater jutting out from the main mass of the mountain on its northwest side. On reaching the rim of the cone and looking down into a deep gorge lying between the secondary crater and the main mass of Shasta, they saw directly beneath them a fine glacier which started almost at the very crest of the main mountain, flowing toward them and curving around the circular base of the cone. Its entire length in view was not less than three miles; its width opposite the station occupied by the party was about 4,000 feet, the surface here and there terribly broken in "cascades," and presenting all the characteristic features of similar glaciers elsewhere. The region of the terminal moraine was more extended than is usual in the Alps. The piles of rubbish superimposed upon the end of the ice indicated a much greater thickness of the glacier in former days. From the crest Mr. King walked out to the north-

ern edge of a prominent spur, and looked down upon a system of three considerable glaciers, the largest about 4½ miles in length and 2 or 3 miles wide. The Konwakiton glacier, shown in our picture, is situated on the southeastern slope, and fills a basin at the head of a deep and rugged cañon. Its foot is at the altitude of about 12,000 feet, and from beneath it a stream flows down the gorge, at times disappearing beneath a flooring of ice covered with boulders and débris derived from the walls that overshadow it. This stream falls in a cascade in the upper portion of the cañon, and at a lower altitude it forms another beautiful waterfall about 400 feet in height. The surface of this glacier has an area of about 320,000 square feet.

II.—GLACIERS OF MOUNT RANIER.

The region around Puget's Sound is perhaps more picturesque than any corresponding portions of the United States. It combines the grandeur of mountain peaks and the placidity of the waters of the Sound. Opposite Tacoma is Mount Ranier, which lifts its snow-capped peak far into the air. Its summit is formed by three peaks, a southern, an eastern and a northwestern. Of these the eastern is the highest, while those in the south and northwest, being apparently a few hundred feet lower, are distant about two miles and are separated by deep valleys. The eastern peak, which appears to have formed originally the middle of the mountain mass, is a crater about a quarter of a mile in diameter and of a circular form. Its sides are bare for nearly 60 feet from the river, below which they are covered by a névé, having a slope of from 28 degrees to 31 degrees. This névé, extending from the shoulders of the southwestern peak to those of the northern, a width of several miles, descends to a vertical distance of about 2,000 feet below the crater rim, an immense sheet of white granular ice, having the general form of the mountain surface, and broken only by long, transverse crevasses, one of which is nearly two miles in length. It is there divided up by the several jutting rock masses or shoulders of the mountain into the Nisqually, Cowlitz and White River glaciers, falling in distinct ice-cascades for about 3,000 feet at very steep angles, which sometimes approach the perpendicular. From the foot of these "cascades" flow the glaciers proper, at a more gentle angle, growing narrower and sinking deeper into the mountain as they descend. From the intervening spurs, which slope even more gradually, they receive many tributary glaciers, while some of these secondary glaciers form independent streams, which only join the main river many miles below the end of the glaciers.

MOUNT RANIER, WASHINGTON TERRITORY.

Railroad Companies as Coal Miners and "Reasonable" Tolls.—The Missouri Railroad Commissioners heard complaints, arguments, etc., from Jan. 25 to June 22, in a case against the Missouri Pacific Railroad and have just made their decision. Complaint was that 65 cents per ton on coal from Lexington and Wellington to Kansas City was too high and unjust. Also that the Missouri Pacific Railroad gave other shippers better terms. Commissioners decide that 55 cents for a 2,000 pound ton is a reasonable rate on the Missouri Pacific Railroad, east of Kansas City for distances up to 55 miles. It is ordered that this be the rate on and after July 27. The charge of discrimination was dismissed. The commissioners gave facts about the ownership of Lexington Coal and Mining Company by the Missouri Pacific Railroad and claim that under the law a corporation cannot do other business than that provided for in its charter. They decide that a railroad company owing and operating a coal mine for commercial purposes is a violator of the law. The company can own and mine for its own use, but not for commercial purposes. Commissioners then say that they have no power to stop the Missouri Pacific Railroad in this direction, but desire to record their opinion that such ownership is contrary to public policy, an injustice to private coal operators, and a direct violation of the constitution of Missouri. A year ago this railroad owned $90,277 stock of the Lexington Coal Company, which yielded $9,750 income. It also owned $1,864,800 stock in other coal mines.

A THEORY OF ASPHALTO-GENESIS.

Written for the Engineering and Mining Journal by Henry Wurtz, Ph. D.

A broader or more general title for this subject would be *Sterro-Carbohydro-Genesis* (Greek: στερρος—solid), which would comprehend all solid carbo-hydrogen minerals, inclusive of mineral resinoids, ceroids or mineral waxes rock-tars and coals. But as, with the exception of a few of the oils, resinoids and ceroids, these (especially coals) must now be excluded from our direct consideration, the first title seems at the present writing the most appropriate.

Asphalts and asphaltoid minerals are so abundant throughout the earth, and of late years have obtained so many and such important practical uses, that their scientific study, as yet almost neglected, appears to be strongly called for. Even reliable analyses of asphalts are wofully deficient, and Dana states expressly that most of the few analyses cited by him need revision.

The conditions under which true asphalts mainly occur have impressed upon chemists and mineralogists the general belief that they are always derived from liquid rock-oils, issuing from the earth, which are by some process, the nature of which has been a matter of controversy, transmuted into solid forms. This transmutation was in early days believed to be simply a matter of evaporation, with deposition of a residuum or *caput mortuum* of solid substance, previously dissolved in the rock-oil. Undoubtedly in most cases there is more or less of such residuum, but this view is totally inadequate to account for the enormous production of asphaltum in numerous localities, in some cases from oils which leave on evaporation but trifling residues, and yet form heavy beds of asphaltum.

The hypothesis was then brought forward that atmospheric *oxidation* of rock-oils was the asphaltogenetic agency. Extended laboratory experiments were made to show that, on passing hot air through petroleum, asphaltoid substances resulted. These, however, were small in quantity and contained so much more oxygen than the generality of true asphalts that the result was far from satisfactory. It may be admitted, however, that oxidation does sometimes take part in the production of asphalts. But there are, nevertheless, asphalts and asphaltoids, which are formed with rapidity and in abundance, that contain a proportion of oxygen so small as to be almost inappreciable. That from Bastennes, analyzed by Ebelmen, gives for each equivalent of carbon but ·01 equivalent of oxygen; that from Caxitambo, of Boussingault, for each equivalent of C but ·0013 equivalent of O; Regnault's Cuban asphalt, for each C but ·05 of O; and albertite, by Wetherill's analysis, for each C but ·016 of O.

Hence the next step was the invention of a new word, to wit, *inspissation*, which was and is extensively applied, and to this day appears to give entire satisfaction to some writers. By these it seems to be regarded as fully meeting the case. To the present writer, however, inspissation has always seemed to be a mere phrase, conveying nothing but a verbal generalization, like the words "catalysis" and "allotropism" of Berzelius, for example. The original Latin *spissatus* simply means "made thick" or "stiffened," the prefix *in* merely adding euphony and emphasis to the word, as anglicized.

The view that has now for many years been held by the writer, as to the main agencies of transformation of liquid rock-oils into solid and semi-solid asphalts, is based mainly on what is known as *polymerization*. This is regarded by chemists in general as due to and dependent on the coalescence of two or more molecules of an element or compound into one, being inclusive and explanatory, as thus regarded, of the allotropism of Berzelius.

Polymerism has, until of late years, been treated of, even in accepted chemical books of reference, as a curious and rare phenomenon, outside of the ordinary range of chemistry. Now, however, it is rapidly being recognized as one of the most important fundamental principles of the science, and its phenomena as among the commonest of occurrences.

Not many years since almost the only instance of this sort of

transformation on which stress was laid in the text-books of the schools was the case of common or acetic aldehyde. This transparent liquid, C^2H^4O, boiling at 70 degrees Fahrenheit, never yet frozen, and having specific gravity = 0·8—when simply put into contact with mere traces of sulphuric or hydrochloric or other acid at ordinary temperatures—spontaneously (the acid remaining entirely unaltered) becomes paraldehyde $C^6H^{12}O^3$, a liquid molecule made up of a congeries of three molecules of aldehyde itself, boiling now at 255 degrees Fahrenheit, having the specific gravity of water, and freezing solid at 22 degrees Fahrenheit. If the temperature of the aldehyde when in contact with the acid be below that of melting ice, a still more condensed and *solid* polymere, called metaldehyde, is formed. This, when quickly heated, may even be sublimed, and requires a temperature of 240 degrees Fahrenheit, acting through many hours, to transform it back again into common aldehyde. Another aldehyde-polymere, aldol, is formed by simultaneous contact with an acid and water at low temperatures. It is $C^4H\ O^2$, that is, *dialdehyde*, is syrupy or tar-like in consistence, and when once formed remains unaltered at the heat of boiling water.

Other aldehydes undergo equally strange transmutations, and in the case of one of them, as will appear below, such transformations stand among the most wonderful and momentous yet developed by chemical science.

There is one case known of the spontaneous formation of a permanent and unalterable solid polymere *directly from a gas*. This is in the case of a compound of bromine discovered years since by the great English chemist Hofmann, called ethenyle bromide, or vinyle bromide, C^2H^3Br. This gas, when condensed by snow and salt, and sealed up hermetically in a glass tube, after a while is found to have become wholly or partially converted into a white, opaque, chalky-looking body. Some six months since the writer had occasion to repeat this experiment of Hofmann (not improbably for the first time in America). The white, chalk-like product has remained freely exposed to the air since its formation in a loosely covered pasteboard box, without change. There is no smell of bromine from it.

It is to be remarked that in all cases of series of polymeres, there is a progressive increase in all chemical and physical properties as the polymerism increases. Thus we have the three following polymeres:

Acetylene	C^2H^2, a permanent gas.	
Benzole	C^6H^6, a liquid, specific gravity =	·884; boils 177 deg.
Styrolene	C^8H^8, a liquid, specific gravity =	·926; boils 293 deg.
Metastyrolene	n (C^8H^8), a solid, specific gravity =	1·058; ———

The next example that will be given is of a more complex character, while directly pertinent to our subject It is a result of researches of the writer which bring into polymeric relations with the *Terpenes* (or hydrocarbons of the essential oils of plants) a number of native resinoid and asphaltoid minerals.

TERPENE-POLYMERES, AND THEIR OXIDES, ETC.

	Composition.	State.	Spec. grav.	Boils.
1. Isoprene, or Isopropene, obtained from distillation of caoutchouc	C^5H^8	Liquid	0·69	100° F.
2. Terpenes	$C^{10}H^{16}$	"	0·87	320° "
				Melts.
3. Kranzite	n [($C^{10}H^{16}$)·O^4]	Solid	0·968	437° F.
4. Bathvillite	n ($C^{10}H^{16}$·OH)	"	1·01	.....
5. Trinkerite, of Tschermak	n [2 ($C^{10}H^{16}$)·(OS)]	"	1·025	356° "
6. Walchowite (at least)	12($C^{10}H^{16}$)O^{10}	"	1·035	482° "
7. Copalite (fossil copal)	n [($C^{10}H^{16}$) O]	"	1·051	.....
8. Succinite (amber)	n [($C^{10}H^{16}$)·O^2]	"	1·073	548° "
9. Tasmanite	n [($C^{10}H^{16}$)·(OS)]	"	1·18	.....
10. Torbanite (Boghead mineral)	n [($C^{10}H^{16}$)·OH]	"	1·185	.....

There is as yet no means known of determining the value of n, in these formulæ; but such means will doubtless be discovered hereafter. (The anomaly observed in the case of kranzite, having a higher melting point than trinkerite, is due probably to the former containing some admixture of amber.)

There is one series of hydrocarbons, the *olefines*, which constitute the bulk of many of the rock-oils, as the Caspian, Burmesé, Canadian, Galician and others. The oils mentioned are, in fact, mostly made up of olefines, with another series isomeric therewith, called the *additive benzoles*.

In the olefines all the members are polymeres of the first or lowest member, methylene CH^2; the second member being ethylene or olefiant gas. The third, propylene, is also a gas; so that the fourth, butylene, C^4H^8, which boils at 57 degrees Fahrenheit, is the lowest liquid member. It is little known. But the fifth member, amylene, C^5H^{10}, is well known as a compound greatly addicted to polymerism. It boils at 95 degrees, the same as common ether, and has a specific gravity = ·663. Contact with acids and some other agents converts it into diamylene, $C^{10}H^{20}$, an oily liquid boiling at 305 degrees, and having specific gravity = ·778. Contact with chloride of zinc, with heat, converts it into triamylene, $C^{15}H^{30}$, boiling at 476 degrees (specific gravity = ·814), and, further, into tetramylene, $C^{20}H^{40}$ (specific gravity = ·871), boiling at 743 degrees. This doubling-up of the molecules is readily proved by the densities of the vapors of these compounds, the vapor of tetramylene being, of course, four times as heavy as that of amylene. It is, indeed, as high as 9·7 times the density of air, and much heavier than the vapor of mercury, which is only about seven times as heavy as air.

Further doubling up must, of course, give us *solid* olefine polymeres. Of these, two members of the series are well known: *cerotene*, $C^{27}H^{54}$, of specific gravity ·861 and melting at 136 degrees; and *melene*, $C^{30}H^{60}$, of specific gravity ·89 and melting at 144 degrees. The last is a hexamylene.

As the readers of the ENGINEERING AND MINING JOURNAL know, from a recent recurrence to the subject,* the native ozocerites and zietrisikites were proved by the writer ten years ago, by the collection, recomputation and tabulation of all the analyses on record, to be olefines; and the conclusion appears inevitable that they have been formed by a polymerization of liquid olefines of rock-oils. Ozocerite has a specific gravity = 0·9 and melts at 145 degrees (Dana's *maxima*); so that it appears very near to the melene $C^{30}H^{60}$, of Brodie,† * * * and possibly identical with it.

* ENGINEERING AND MINING JOURNAL, April 5, 1879, p. 235.
† Poggendorff's Annalen, 71, 150.

Zietrisikite has specific gravity = 0·946 (Malaguti) and melts at 194 degrees (Dana).

A theory of chemi-genesis of ozokerites and related minerals, or natural solid olefines (as well as that of rock-oils generally, and even coals), from the paraffine hydrocarbons, and even from marsh gas, has already been ingeniously attempted by J. Grabowsky.* He says: "The composition of ozokerite is best expressed by the formula C_nH_{2n} (that of the olefines). Very little is known about its formation. It appears to me very probable that it has to be considered as a product of the oxidation and condensation of petroleum hydrocarbons. Only lately we have seen that hydrocarbons, as, *e. g.*, naphthalene, can form by oxidation not products containing oxygen, but dinaphthyl.

$$2\ C^{10}H^8 + O = C^{20}H^{14} + H^2O.$$

"By supposing a similar oxidation of hexane or octane, we obtain compounds of the formula C_nH_{2n}, which again may condense with hydrocarbons of the marsh-gas series, and thus give rise to the production of very complicated hydrocarbons of high melting-point, *e. g.*:

$$(1.)\ 2\ C^8H^{18} + O^2 = C^{16}H^{32} + 2\ H^2O.$$
$$(2.)\ C^{16}H^{32} + C^8H^{18} + O = C^{24}H^{48} + H^2O.$$

"By this hypothesis, the formation of petroleum may be reduced to an oxidation of marsh gas, and thus the close connection between ozokerite, petroleum and coal be explained in the most simple manner."

Difficulties arise in following up Grabowsky's suggestions. It requires at the outset the instrumentality of free oxygen, whereas the ozokerites are even more abundant and quite as perfectly formed as we get further below the sphere of penetration of free oxygen. If, however, we admit the possibility of an oxidation of marsh gas, of this kind, with production of H^2O and CH^2, the simple polymerization of the latter, according to the notions of the present writer, is all that is needed to engender the olefines, gaseous, liquid and solid.

The writer prefers to regard the marsh gas, which is known to be more abundant in ozokerite-mines in depth than even in coal-mines, not as having engendered the ozokerites themselves, but as a concomitant product. His hypothesis starts also with paraffine hydrocarbons, and is founded primarily upon the facts, discovered in 1872 by the English chemists, Thorpe and Young.† This is the breaking-up, under the conjoined influence of heat and pressure, of the paraffine or methane homologues, into methane and an olefine. Such olefine, then, under the same influences of heat and pressure, conjoined quite possibly with other influences, polymerizes either into liquid rock-oils or into solid mineral waxes, according to the existing conditions. Thus:

$$C^{11}H^{24} = CH^4 + C^{10}H^{20}:$$

and then:

$$3\ C^{10}H^{20} = C^{30}H^{60};$$

which is an average ozokerite (close to the melene of Brodie, obtained by the distillation of beeswax) melting about 144 degrees Fahrenheit, and with specific gravity 0·89.

This view needs no free oxygen, and accounts for the abundance of CH^4 or firedamp in the ozokerite mines. It is also altogether founded on known general principles of very wide application.

We will now turn back to the aldehydes, and will find in a recent discovery of the illustrious German chemist, Baeyer (the discoverer of artificial indigo, of sulphonal, etc., etc.), the wonderful series, hinted at above, of polymerisms, as produced by the rays of the sun. Baeyer finds that the primary function of the leaves of plants, under the sun's heat, is to form from carbonic dioxide and water, the compound *formic aldehyde*, CH^2O (discovered by Hofmann). Thus:

$$CO^2 + H^2O = CH^2O + O^2.$$

Hence, the well-known evolution of free oxygen from the leaf during growth. Next, the sun-ray polymerizes this formic aldehyde into sugars, starches, cellulose, gums, etc., etc.; these being, therefore, all polymeres of formic aldehyde!

EXAMPLES.

1. $6\ CH^2O + H^2O = C^6H^{12}O^6 \cdot H^2O$—Crystallized fruit-sugar or glucose; spec. grav. ..... = 1·388.
2. $12\ CH^2O - H\ O = C^{12}H^{20}O^{10} \cdot H^2O$—Gum; spec. grav. .... = 1·487.
3. $12\ CH^2O - 2\ H^2O = C^{12}H^{20}O^{10}$—Cellulose; spec. grav. .... = 1·525.
4. n ($CH^2O - H^2O$) = n ($C^6H^{10}O^5$)—Starch; spec. grav. ..... = 1·56.
5. $12\ CH^2O - H^2O = C^{12}H^{22}O^{11}$—Cane sugar; spec. grav. .... = 1·6.

It appears, therefore, that at the outset of the organization of matter into living molecules to form the pabulum for all life upon the earth, the ruling transmutation is polymeric.

The preceding discussion will, as the writer trusts, have rendered intelligible his view of the mode of formation of asphalts and asphaltoids from rock-oils, thus: *Asphalts and asphaltoids are mainly produced from rock-oils by polymerization of certain constituents of such oils under the influence of the air, or of the sun's rays, or of both, together with the influence of acid, saline or other polymerizing agents incidentally present.*

It remains to be added, however, that there is ample evidence of spontaneous polymerisms of many native carbohydrogen liquids, as in case of Hofmann's bromine compound above—by mere lapse of time, without the influence of other agency than that of *temperature*. Thus the above view takes in the formation of dikes, veins and inclosed pockets of asphaltic and asphaltoid matters, such are known to occur abundantly.

2142 SEVENTH AVENUE, NEW YORK, June 29, 1889.

PRODUCTION OF PIG-IRON IN THE UNITED STATES IN 1889.

The American Iron and Steel Association has received from the manufacturers complete statistics of the production of pig-iron in the United States in the first six months of the present year, also complete statistics of the stocks of unsold pig-iron in the hands of manufacturers or their agents on the 30th day of June last.

The production of pig-iron for the first half of this year amounted to 4,107,899 net tons, or 3,667,767 gross tons, while the stocks on June 30th, 1889, were 563,286 net tons, or 502,934 gross tons.

These figures show that while the iron trade in the East particularly has

* On Galician Ozokerite and Ceresine: *Polyt. Centralbl.*, XVIII., 139; *Wagner's Berichte*, 1877, p. 1,039; *Hubner's Zeitschr., für die Mineralöl-Industrie*, etc.; *Am. Chemist*, October, 1876, p. 124; *et al.*
† Effects of Heat and Pressure on Paraffines. *Jour. London Chem. Soc.*, XXV., 802; *Chem. News*, 1872, p. 35; *Watts' Dictionary*, 2d Suppl., p. 862; *et al.*

appeared dull, in reality we have made 725,396 tons more of pig-iron than in the first half of 1888 and even 222,000 tons more than in the last half of 1888. The increase in production has been nearly altogether in coke and bituminous coal made iron, anthracite iron have declined quite perceptibly. Stocks of pig-iron have increased about 227,000 tons during the half year, so that the increase has been almost exactly as large as during the last half of 1888. The increase in stocks has been chiefly in anthracite iron, though all kinds increased somewhat.

The production of Bessemer iron declined slightly during the six months, owing, of course, to the small demand for steel rails.

On the whole, the iron business has not been as bad as generally supposed, and the East, the anthracite pig-iron districts, have suffered the most. These statistics emphasize the necessity for lower freight rates, which means lower cost of raw material at the Eastern works, if they are to live in competition with the South and Northwest. We make the following extracts from this valuable report:

PRODUCTION OF ALL KINDS OF PIG-IRON.

Total Production of Pig-Iron.

STATES.	Blast furnaces.				Production. Tons of 2,000 pounds. (Includes spiegeleisen.)		
	In blast June 30, 1888.	June 30, 1889. In	Out	Total	First half of 1888.	Second half of 1888	First half of 1889.
Maine	1	1	....	1	2,550	3,024	2,700
Massachusetts	2	2	2	4	7,005	6,243	2,651
Connecticut	4	5	4	9	10,236	11,408	12,108
New York	15	14	24	38	134,900	122,280	144,613
New Jersey	6	7	11	18	50,393	51,489	67,749
Pennsylvania	130	124	110	234	1,630,845	1,958,341	2,012,804
Maryland	3	2	11	13	6,250	11,356	10,233
Virginia	12	13	20	33	92,495	104,901	112,328
N. Carolina	1	1	1	2	1,100	1,300	922
Georgia	2	1	3	4	23,658	15,739	11,338
Alabama	23	29	12	41	169,696	279,796	364,346
Texas	1	1	....	1	2,968	3,619	1,411
West Virginia	1	3	6	9	45,601	49,658	72,775
Kentucky	6	4	3	7	21,267	35,523	23,865
Tennessee	14	12	8	20	122,817	145,114	147,401
Ohio	38	40	37	77	528,536	575,282	602,476
Indiana	1	..	2	2	7,300	7,960	7,806
Illinois	7	9	7	16	294,520	284,787	282,153
Michigan	12	9	18	27	106,578	106,673	103,363
Wisconsin	6	5	5	10	51,477	64,560	74,055
Missouri	4	4	6	10	60,789	30,994	42,795
Minnesota	....	....	....	....	....	....	....
Colorado	1	....	2	2	11,522	9,355	....
Oregon	....	1	....	1	....	2,509	5,426
California	....	....	1	1	....	....	....
Washington Territory	....	1	....	1	....	4,093	5,571
Total, pig	290	288	293	581	3,382,503	3,886,004	4,107,899
Charcoal pig	70	63	94	157	273,238	320,551	306,780
Coke and bituminous pig	128	145	97	242	2,148,817	2,595,172	2,883,598
Anthracite and mixed pig	92	80	102	182	955,448	970,281	917,611

SPIEGELEISEN.—The quantity of spiegeleisen and ferro-manganese made in the first half of 1888 was 21,162 net tons; in the second half, 33,607 tons; in the first half of 1889, 34,766 tons

Total Stocks of Unsold Pig-Iron.

STATES.	Tons of 2,000 lbs.			
	Dec. 31, 1886.	Dec. 31, 1887.	Dec. 31, 1888.	June 30, 1889.
New England	9,218	7,930	11,266	19,347
New York	28,202	35,019	31,224	58,169
New Jersey	1,632	22,211	23,817	27,552
Pennsylvania	71,202	154,175	109,003	195,931
Maryland	5,445	1,167	1,900	2,218
Va., N. C., Ga., and Texas	13,346	6,848	18,913	30,662
Alabama	14,025	14,248	23,851	36,449
West Virginia	4,680	4 835	400	3,217
Kentucky	4,218	4,324	8,970	8,050
Tennessee	14,488	7,726	8,282	17,565
Ohio	24,069	33,007	32,103	70,909
Michigan and Indiana	41,953	39,319	39,886	37,257
Illinois	300	.....		.....
Wisconsin	6,002	845	7,163	17,365
Colorado and Missouri	7,682	5,329	11,701	33,438
Pacific States	6,232	1,159	2,682	5,157
Total pig	252,704	338,142	336,161	563,286
Anthracite and mixed pig	50,503	114,107	106,529	165,334
Charcoal pig	131,567	96,057	111,371	150,388
Bituminous and coke pig	70,634	127,978	118,261	247,564

Production of Bessemer Pig-Iron.

STATES.	Tons of 2,000 lbs.		
	First half of 1888.	Second half of 1888.	First half of 1889.
New York	18,732	33,342	29,233
New Jersey	14,585	12,820	13,946
Pennsylvania	746,479	1,024,065	990,239
West Virginia	38,557	45,576	63,042
Tennessee	2,315	.....	.....
Ohio	138,828	197,927	207,407
Illinois	275,675	275,401	247,101
Missouri	54,144	22,376	37,080
Michigan	3,000	.....	.....
Wisconsin	17,136	17,400	1,625
Colorado	10,478	5,566	.....
Total	1,319,929	1,634,473	1,589,673

Nova Scotia Marble.—The owners of the red marble quarry at Walton, N. S., have contracted to supply a large quantity of marble for the new building of the New York *World*. This building is to be seventeen stories in height, and all the interior decorations and fittings, such as counters, mantels, lintels, etc., are to be of the Walton marble. The selection of Nova Scotia marble in the decorative work of one of the largest buildings ever constructed in New York City shows that this stone may prove a formidable competitor against the Vermont, New York and Tennessee marbles.

Preservation of Iron Stacks.—According to a correspondent of the *Artisan*, a simple plan of preventing sheet iron stacks from rusting is as follows: If before raising the new chimney, each section, as it comes from the shop, be coated with common coal tar, then filled with light shavings and fired, it will resist rust for an indefinite period, rendering future painting unnecessary. In proof of this he cites a chimney which was erected in 1866, treated as above described, and is to-day as bright as it was the day it was raised, without having a particle of paint applied since. The theory by which he accounts for this result is that the coal tar is literally burned into the iron, closing the pores and rendering it rust proof.

An Acid-Proof Paint.—A successful experiment is reported to have been made recently at the laboratory of the Joseph Dixon Crucible Company, in Jersey City, N. J. A piece of iron 10 inches long, 2 inches wide and $\frac{1}{16}$ of an inch thick was used, and one-half of its surface painted with silica-graphite paint, while the other half was left unpainted. It was suspended for several days in a bath of dilute sulphuric acid. This bath was much stronger than any sulphur water met with in mining. On taking the iron from the bath the unpainted part was found eaten off to about one-half its original bulk. The painted part did not sustain even the slightest blemish, thus apparently proving the ability of this paint to withstand sulphuric acid, and demonstrating its usefulness where iron piping is laid in acid water, such as is sometimes met with in mines containing pyrite or other sulphides, which, under certain conditions, produce acid waters in the form of sulphate solutions, resulting from the decomposition of the sulphide minerals.

Government Statistics.—Some interesting statistics may be gathered from the last statistical abstract of the United States. As summarized in *Bradstreet's*, it appears that the revenue of the government amounted in the fiscal year 1888 to $6.32 for each inhabitant. The expenditures of the government, not including payment of the national debt, amounted to $4.47 for each person. The national debt amounted to $17.71 a head, and the interest thereon to 65 cents. The duties collected on imports amounted to $3.47, and the internal revenue amounted to $2.07 a head. The average *ad valorem* rates of duty on all imports in 1888 amounted to 30 per cent, and the average *ad valorem* rates on all dutiable imports amounted to 45·63 per cent. The estimates above given are based upon an estimate of a population of 60,018,000 made by the actuary of the Treasury Department. This estimate is in all probability too low. An increase of the figure for population would, of course, require a slight reduction in the amount for each person. The statistics regarding savings banks over a period of five years show a steady growth in the number of deposits and in the aggregate amount of deposits, with but a slight change in the average amount due each depositor. In 1887-88 the aggregate deposits amounted to $1,364,196,550, the number of depositors amounted to 3,838,291, and the average amount due each depositor was $355.41.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED JULY 23D, 1889.

407,327. Electric Generator Charles E Buell, Newark, N. J.

407,335. Apparatus for Separating Lead or Bullion in Smelting from Slags, Mattes or Speiss. Walter B. Devereux, Aspen, Colo.

407,336. Apparatus for Separating Slags, Mattes and Speiss, and Lead or Base Bullion in Lead Smelting. Walter B. Devereux, Aspen, Colo.

407,337. Method of Separating Lead and Base Bullion from Slag, etc. Walter B. Devereux, Glenwood Springs, Colo.

407,344. Furnace Grate. Eugene N. Gates, Fitchburg, Mass

407,367. Pulley. Peter McNaughton, Kalamazoo, Mich., Assignor to Charles H. Bird and Erastus W Crane, same place.

407,370. Piston Packing. Edward F. Peacock, Philadelphia, Pa.

407,384. Machine for Making Curved Lead Pipe. George W. Wicks, Brooklyn, N. Y.

407,386. Bath or Solution for Separating Metals from their Ores. Jacob C. Wiswell, Medford, Assignor, by direct and mesne assignments, to the Electric Gold and Silver Chlorination Company, Boston, Mass.

407,399. Art of Welding Metal Foil. John H. J. Haines, Flushing, N. Y., Assignor of one-half to Alexander G. Fernald, Jersey City, N. J.

407,406. Limekiln. Frederich Kranz, Sandusky, Ohio.

407,413. Pipe Thread-Cutting Machine. Thomas McFadden and David Rosser, Youngtown, Ohio.

407,432. Discharge Apparatus for Coal or Ore Bins. Warren Dunbar, Minneapolis, Minn.

407,435. Feed-Water Heating and Circulating Apparatus. Robert Fraser, Liverpool, County of Lancaster, Eng.

407,461. Automatic Telegraphy. Frank Anderson, Peekskill, N. Y.

407,470. Circuit for Electric Railways. Henry H. Cutler, Newton, Mass.

407,496. Electrical Railway. Sidney H. Short, Denver, Colo., Assignor to the United States Electric Company, same place.

407,504. Automatic Switch for Railways. John T. Argo, Poindexter, Ky.

407,515 Draughtsman's Protractor. William W. Duffield, Detroit, Mich.

407,530. Machine for Shaping Sheet Metal. Thomas W. Irwin, Allegheny, Pa.

407,531. Ore Separator. James Jenkins, Harrisburg, Pa.

407,555. Mechanism for Converting and Reversing Motion. Thomas C. Thomas, Salt Lake City, Utah.

407,556. Device for Handling Coke. Joseph Watts. McKee's Rocks, Pa.

407,580. Pumping Engine. Henry Davey, Westminster, County of Middlesex, Eng.

407,600. Steel Furnace. Louis G. Laureau and Fred W. Gordon, Philadelphia, Pa., Assignors to Gordon, Strobel & Laureau (Limited), same place.

407,612. Wire Working Apparatus. David Rawson, Pittsburg, Pa., Assignor of one-half to Arthur J. Wilkinson, same place.

407,638. Apparatus for Burning Hydrocarbons as Fuel. James H. Bullard, Springfield, Mass., Assignor to the Aerated Fuel Company, same place.

407,644. Locking Rail Joint. Preston C. Dockstader, Colorado Springs, Colo.

407,659. Welding Compound. Hiram G. Hicks, Worcester, Mass.

407,675. Tube-Bending Machine. John F. McNutt and Hiram F. Grimmesey, Warren, O.

407,676. Double-Seated Valve. Augustus F Nagle, Chicago, Ill.

407,681. Detachable Pipe Joint. Isaac B. Potts, Columbus, O.

407,683. Combined Detachable Pipe Coupling and Branch. Isaac B. Potts, Columbus, O.

407,693. Roller Bearing for Pulley Blocks. Henry A. Rooke, Liverpool, County of Lancaster, Eng.

407,696. Apparatus for Casting Metals under Pressure. John J. C. Smith and Charles Grasser, Passaic, N. J., Assignors to the Smith Brothers Manufacturing Company, same place.

407,704. Tripod Support for Rock Drills. Abraham J. Sypher, Iron Mountain, Mo.

407,744. Sectional Steam Boiler. John Rowbotham and William Rowbotham, Merchantville, N. J., said William Rowbotham Assignor to said John Rowbotham.

407,745. Electrical Railway. Sidney H. Short, Denver, Colo.

PERSONALS.

Mr. Thomas A. Edison expects to leave for Europe on Aug. 3, and will be gone abroad for several weeks.

Mr. M. E. Smith has been appointed assayer in charge of the United States branch mint, in Denver, Colo., to succeed Dr. Munson.

Mr. Alexander C. Sheneweth has been appointed engineer in the department of public works, New York, in place of Mr. Samuel H. Cooper.

Mr. Edmund C. Pechin, of Cleveland, Ohio, has been engaged by the Virginia Steel Company as Geologist and Mining Engineer, with headquarters at Roanoke, Va.

Mr. E. E. Olcott, Mining Engineer, is at present in British Columbia on professional business, and expects to return in October via Oregon and the Northern Pacific Railway.

Mr. S. T. Wellman, the able manager of the Otis Steel Company, Cleveland, O., has been appointed Consulting Engineer for the Illinois Steel Company at Chicago, Ill.

Prof. C. R. Van Hise, of the University of Wisconsin, has taken up the work on the U. S. Geological Survey of the late Prof. Roland D. Irving. Prof. Van Hise is now carrying on work started by him on the Marquette, Mich., Iron Range.

Lieut. Frank E. Hobbs, of the Ordnance Department, has been ordered from South Bethlehem, Pa., to the works of the Standard Steel-Casting Company, Thurlow, Pa., on business in connection with work on steel castings for guns for the Ordnance Department.

Mr. D. W. Langdon, Jr., who has been for a number of years connected with the Alabama Geological Survey, has entered upon the duties of Geologist and Consulting Mining Engineer of the Chesapeake and Ohio Railway, probably with headquarters at Richmond, Va.

Sir Guilford L. Molesworth, the well-known engineer, and the author of "Molesworth's Engineering Pocket-Book," passed through New York on his way from India to England. He recently resigned the position of Consulting Engineer for State Railways to the Government of India, which he has held for several years.

By a resolution abolishing the office of consulting engineer, the aqueduct commissioners, New York, on the 25th inst., removed Colonel B. S. Church from that position. The abolition takes effect on August 1st. Colonel Church has been consulting engineer since November last at a salary of $8,000 a year, and was chief engineer from the beginning of the aqueduct until November. The resolution stated that the aqueduct was so nearly completed that the office was unnecessary.

Mr. Robert Grimshaw, Consulting Engineer, New York, has been appointed by the French Ministry of Commerce and Industry, a member of the Committee on Patronage of the International Congress of Applied Mechanics to be held in Paris in September. He expects to present before that Assembly a paper on Improvements in Steam Engines since 1878, and will be pleased to receive from engine builders novelties or improvements that have been brought out during the past ten years.

OBITUARY.

Chief Engineer Elbridge Lawton, United States Navy, retired, died of paralysis at his home in South Boston, Mass., on the 24th inst., aged sixty-three years.

Mr. James Beggs, the well-known mechanical engineer, committed suicide at Trenton, N. J., on the 19th inst. No doubt is entertained but that his death was the result of temporary insanity.

James R. Poloch, who died recently at his summer residence in the Adirondacks, was superintendent of the Jewett White Lead Company, at Port Richmond, Staten Island, for twenty-five years.

News comes from Sydney of the death of Mr. J. B. Watson, an Australian "Quartz Reef King," and one of the richest men in the colony. He was a native of Paisley, and born in 1825. When quite a youth he emigrated. On his landing at Melbourne he proceeded to Sandhurst, where his figure was known on the White Hills as far back as 1854. By dint of great exertion he saved a sum sufficient to enable him to purchase a puddling machine, which was of material help to him at the diggings, and with this instrument he managed to save several thousand pounds. He then migrated to the celebrated gold mine of Bendigo, which has since become known throughout the world for its wonderful productiveness of gold, and which he now leaves to his family.

Mr. John Hughes, the well-known ironmaster and engineer, who died suddenly the other day in St. Petersburg, Russia, was one of the most remarkable Englishmen who have occupied themselves with developing the vast resources of the Russian Empire. The deceased was principally known as the founder and director of the new Russian company in the town of Hughesoffka, in South Russia. The iron and engineering work at Hughesoffka are the largest in Russia, and on the spot where, in 1860, there were only a few huts there now exists a large town with 15,000 inhabitants, thanks to the indomitable energy of Mr. Hughes. John Hughes was not only a clever engineer, but was also known as an inventor. While director and owner of some mechanical works in Newport, in South Wales, he invented the first coal lift, now used in the pits. At the time of his death he was engaged in a project for developing the immense coal and iron beds of South Russia. The deceased was born at Merthyr, in South Wales, and was 75 years of age.

Charlemagne Tower, of Philadelphia, died on the 25th inst. at his summer residence, Waterville, N. Y., at the age of eighty-one years.

Mr. Tower was born in Oneida County, N. Y. He graduated from Harvard University in 1830. He studied law in this city, where he practiced his profession for some time. Some legal questions that arose in connection with his practice took him to Pennsylvania in 1846, for the examination of the title to large bodies of mineral land lying chiefly in the County of Schuylkill. Mr. Tower was the leading counsel in the famous trial that arose out of questions relating to the Munson and Williams estate in Schuylkill County, comprising a large body of coal lands, the litigation in regard to which he carried along for more than twenty-five years. He mastered it, and perfected the title to these lands, which are now the property of the Philadelphia & Reading Coal and Iron Company, and his footsteps may be traced through many other great legal battles in different counties in Pennsylvania.

He became the owner of large bodies of coal lands, and was a director in several corporations. He was actively interested in the construction and management of the Northern Pacific Railroad, and was a member of its Board of Directors for several years.

The greatest and most successful undertaking, perhaps, of Mr. Tower's long business career, was his development of the iron resources of Minnesota, now well known to the world as the Vermillion Range. It was about fifteen years ago that Mr. Tower learned of the existence of iron ore deposits near Vermillion Lake, a body of water ninety miles northwest of Duluth. The country was then a wilderness, the forest almost without paths, and exploration a matter of great difficulty. It took an Indian runner four days to make the journey from Duluth to the lake, and Mr. Tower's son, who made the trip to examine the land, was six days and a half traveling from one point to the other.

An expert was sent out by Mr. Tower in 1875 to make a thorough examination, and the report was so favorable that he determined to buy some land and build a railroad to bring the ore to market. He accordingly purchased about 20,000 acres of mineral land near the lake. Years were required to get things into shape, and it was not until 1883 that Mr. Tower had things in readiness for the construction of the railroad. He laid out a line of road from the lake to a point on Lake Superior, about thirty miles northeast of Duluth, called Two Harbors. Here Mr. Tower bought property, constructed docks, and acquired terminal facilities. The mines were opened and a force of men set at worth digging ore. Meanwhile the railroad was being built.

All through the winter of 1883-84 a force of 1500 men was laboring in the Minnesota woods felling trees, grading, and laying ties. The expense was enormous, but Mr. Tower was equal to the demands upon his resources. Hundreds of thousands of dollars were expended and not a cent was coming in. Through the spring of 1884 the work was pressed with vigor, and late in July the road was completed. On July 31, 1884, the first train load of ore passed from Vermillion Lake to Lake Superior, whence it was shipped on barges to Cleveland. Before the close of the year 68,000 tons of ore had been shipped from the mines, and by 1887 the annual output had been increased to 400,000 tons, while it promises to be nearly 1,000,000 tons this year.

On June 5th, 1887, Mr. Tower disposed of his large interests in the Vermillion Range to a syndicate which proposed to extend the railroad and develop the mineral resources of the district to the east and northeast of the property which he had developed. On that day, in Philadelphia, Mr. Tower handed over to the syndicate the stock and bonds of the Duluth & Iron Range Railroad and the title deeds to some 20,000 acres of land, and received in return certified checks on banks and financial institutions to the amount of over $6,000,000.

INDUSTRIAL NOTES.

The paraffine wax refining works of the Tide Water Oil Company at Constable Hook, Bayonne, N. J., were completely destroyed by fire on the 21st inst.

The United States Foundry Company has been organized with a capital of $100,000, by Thomas J. Moore, Jr., and John G. Price, of Brooklyn, and William A. Ross, of West New Brighton, N. Y., for the manufacture of metal castings, chemicals and chemical and metallic compounds in New York.

It is understood that the capitalists of Cleveland, Ohio, have about completed arrangements to establish an iron tubing factory in Ottawa, Ontario. The syndicate say they possess a new welding process. Ottawa was selected as the scene of operations on account of the magnificent water power afforded by Chaudiere Falls.

Judge Coxe, in the United States Circuit Court, New York, has rendered a decision denying defendant's motion for a rehearing in the case of the Electrical Accumulator Company vs. the Julien Electric Company. This gives the complete control of the manufacture and use of secondary batteries to the Accumulator Company owning the Faure Sellon-Volckmar patents.

In the United States Court at Danville, Va., two suits were entered by W. E. Craig against the Bertha Zinc Company, of Pulaski City, Va., for $1,000 penalty in each case for importing foreigners under contract. Frederick Burk and Christian Ronsberg came over from Wales in the steamship Galatia, in July, 1888, each under contract with the company. This is the first case brought in Virginia. It will be tried at the November term.

The Otis Iron and Steel Company, of Cleveland, O., to the sale of which we referred in our last issue, has been organized into an English company, with a capital of £900,000. Shares of the new company have been offered to the public through the Trustees, Executors & Securities Insurance Corporation. The issue is divided into £300,000 first mortgage debentures, £300,000 8 per cent preference shares and £300,000 ordinary stock.

The Commissioner of Patents has decided on final appeal a well-fought Patent Office controversy, involving the exclusive right under letters patent to manufacture rolled cast-steel car wheels. The parties to the controversy are the Fowler Cast Steel Car Wheel Company, of Chicago, Ill., and the Pittsburg Steel Casting Company, of Pittsburg, Pa. The commissioner decided in favor of the Fowler Company, thereby affirming the decision of the Board of Examiners-in-Chief and the Examiner of Interference.

Thomas A. Edison, the inventor, is contesting the decision of the chief clerk of the Patent Office, Pope, at Ottawa, Canada, cancelling the Edison patents for incandescent electric lighting, on the ground of want of jurisdiction. John Carling, Minister of Agriculture, on the 23d inst. granted the application of Edison's solicitor for a rehearing, this time before himself. It was agreed that the same argument should stand, but the advisability of hearing new evidence is now under consideration.

A meeting of a number of sheet iron and sheet mill manufacturers was held at Pittsburg, Pa., on the 23d, at the office of the American Tinned Plate Association to take action on the project to build a tin plate mill on the exposition grounds. It was decided that the Tinned Plate Association should take charge of the project. B. F. Jennings was appointed as treasurer to receive subscriptions from manufacturers for the erection of the plant. On the 27th inst., a meeting of practical workers in the tin plate manufacture will be held in Pittsburg to suggest methods for operating the plant.

The Lidgerwood Manufacturing Company has enlarged its principal office, located at 96 Liberty Street, New York, which will enable them to handle more readily the large and growing business in hoisting machinery and appliances. The company has also just opened a new branch in Boston, at Nos. 197 to 203 Congress street. It will be in charge of Mr. J. H. Houghton, who will also represent the Gorton & Lidgerwood Company. The company has also opened an office in St. Louis, at 717 North 2d street, and Mr. Moses P. Johnson is the newly accredited representative in that city.

The McElroy Car Heating Company, of Detroit, Mich., and the Sewell Car Heating Company, of Portland, Me., have amalgamated. They were the two largest companies of their kind in the country. Together they control 100 patents and have applications for 100 more pending. The capital stock of the Portland company was $1.800,000, and that of the Detroit company $150,000; but the business of the latter was such that it goes into the combine on an equal footing with the larger concern. The capital stock of the new company will be $2,500,000, most of which is in patents. The combined working capital will amount to about $250,000.

It will give an idea of the demand for the Ball automatic cut-off high speed engine, manufactured by the Ball Engine Company, of Erie, Pa., when we mention that the company now have orders for 7,165 horsepower of engines to build for electric light and electric railroad purposes. The company have just completed the first of twelve 300 horse-power compound engines for the Edison Electric Illuminating Company, of Brooklyn, N. Y., and we learn that the test made at their works was highly satisfactory. The first two engines for this plant are about to be shipped to Brooklyn, and when placed on their foundations an exhaustive test will be made.

According to reports the Illinois Steel Company, recently incorporated as a consolidation of the North Chicago, Joliet and Union companies, has decided to go into the business of building steel vessels for lake commerce. It is understood the shipyards are to be located at South Chicago, Ill. The Minneapolis Iron Company, at its recent meeting, voted to place its $1,500,000 surplus in the hands of the directors

The company is controlled by the Illinois Steel Company, and the voting of this surplus was intended to put it at that company's disposal. W. J. Babcock, superintendent of the United Dry Dock Company, of Buffalo, has been selected as the head of the mechanical department of the proposed new yards.

The Westinghouse Company, as owners of patent recently issued to Rankin Kennedy for alternating electric current, will have practical monopoly of only system of electric lighting that can compete with gas, and as their patents ante-date all others they will prosecute infringers. Suits have been begun against the Bedford Electric Light, Heat and Power Company, the Jenny Electric Light Company, of Ft. Wayne, Ind., and the Thomson-Houston Company for infringement on patent granted Westinghouse for a special construction convertor used in alternating current system. All cases are in the United States Circuit Court at Pittsburg, and Mr. Westinghouse says he will lose no time in bringing them to a hearing.

CONTRACTING NOTES.

Manufacturers of machinery, engineers and contractors should consult our directory of "Contracts Open" on page xii. This week proposals are invited for the following new contracts: Grading, Improving and Macadamizing County Roads, Water Works Construction, Water Works Construction, Sewer Construction, Water Works Supplies, Laying Natural Gas Pipes, Cast-Iron Gas Pipe, Electric Lighting, Water Works Construction, Tile Sewers, Water Works Construction, Iron Bridges, Wrought Iron or Steel Bridge.

Messrs. Gordon, Stroebel & Laureau, Limited, Philadelphia, Pa., have closed contract for two 16 × 60 feet Gordon Whitewell Cowper fire-brick hot-blast stoves, to be erected at Trondale Furnace, West Virginia.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column, and his address will be furnished to any one desiring to supply him.

Any one wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

68. Nickel and cobalt ores and furnace products wanted. New York.

99. Shingle machines, double horizontal, two, to cut 150,000 shingles per day, including motive power. British Columbia.

100. Dredges wanted for dry and wet excavation. Georgia.

105. Ice machine, to make 10 to 20 tons per day. Arizona.

106. Wanted, addresses of parties who manufacture a boxing or lining that can be used without oil or greasy lubricator.

AMERICAN GOODS WANTED ABROAD.

22. Firm in Sydney, New South Wales, wants to take the agency for American hardware and machinery

23. Parties in Sandhurst, Victoria, Australia, want to correspond with manufacturers of the following goods: Blasting and sporting powder, bellows, steel for drills, axle grease, wire and hemp rope.

24. Steam inspection cars; also a machine for making soap and candy cases wanted in Sydney, New South Wales.

25. Grease and oils wanted in Melbourne, Victoria, Australia.

26. Household specialties, lumber, paints, oils, saddlery and carriage hardware, Perth, West Australia.

27. Canned goods, in Sydney, New South Wales.

28. A Melbourne, Australia, house wishes to represent American manufacturers of mining and boring machinery.

29. Christchurch, New Zealand, parties desire to hear from manufacturers of fencing wire or fencings also oils and general merchandize.

30. A Christchurch, New Zealand, house wants mining and general machinery.

31. Two houses in Sydney, New South Wales, want agencies for American manufacturers.

32. A firm in Hong Kong wants to correspond with manufacturers of goods saleable there.

33. A house in Pekin, China, wants fancy articles and toys, and would like to correspond with American dealers in Chinese curiós.

34. Parties in Trichinopoly, India, wish to correspond with American house that will buy Indian cigars.

35. A firm in Rangoon, Burma, wants agency for American goods.

36. A merchant in Ceylon wants to correspond with American manufacturers.

37. A correspondent in Barbadoes, West Indies, wants agencies for American goods of all kinds.

38. A firm in the City of Mexico wants to correspond with manufacturers of hardware, agricultural implements, etc.

39. Mexican house wants blasting powder and fuse.

40. House in Panama wants catalogues and prices of goods adapted to their market.

41. Two firms in British Honduras will take the agency for general American wares, particularly articles of domestic utility.

42. A firm in Buenos Aires, Argentine Republic, would like to hear from American manufacturers desiring to be represented there.

43. A mercantile house in Chili, S. A., wishes to correspond with manufacturers of agricultural and mining machinery.

44. The president of a railroad company in the Hawaian Islands wants catalogues and price lists of American railway supplies.

45. A house in the United States of Colombia would like to establish "commercial intercourse" with American manufacturers.

46. Mill engine, coupled at 120 degrees, 20 pounds steam to 1 ind. H. P., guaranteed one year; 3-cylinder engine, one of 24 inches diameter, high pressure, 5-foot stroke; two of 30 inches diameter, low pressure, 1,000 ind. H. P., with 150 steam, 50 revolutions; two 24-foot fly wheels (band wheels), one being 5 feet 3 inches wide, the other 3 feet 2 inches wide. Bolivia.

47. Hoisting engine, maximum capacity 375 tons in 20 hours from depth 2,000 feet in load, maximum 2 tons (2 cars of 1 ton each); direct-acting compound double tandem cylinder, 16 inches high pressure, 36 inches low pressure, 48-inch stroke, cut off at ⅛; two friction drums, 4 feet diameter, 3-foot horns. Bolivia.

48. Eight winze hoists, eight winze pumps, air pipes, column pipes, belting, hose, etc. Bolivia.

49. Compound water pumping engine, to lift 150 feet high. Bolivia.

50. Air compressors (duplex-compound), Corliss-tandum-coupled at right angles. Two air cylinders, 20 inches diameter; high-pressure cylinder, 20 inches; low pressure, 35 inches, 48-inch stroke, with fly wheel, 20 feet diameter, weighing not over 40,000 pounds, engine to cut off up to 4·10 on high-pressure cylinder. Independent compressor and pump. Bolivia.

51. Boilers, six 8 feet diameter, 12 feet long by 3 feet. Corrugated flue under 1,000 H. P., with evaporation of 12½ pounds water to 1 pound Welsh coal. From 120 degrees, sea level, 180 pounds pressure. Bolivia.

52. Six Boilers, 6 feet by 15 feet, tubular, 81 tubes. Grates, 5 feet by 6 feet. Return tubular, with cast front, complete, to evaporate 14 pounds water to the pound of coal (coal costs $50 per ton, gold); 15,000 feet above level of the sea. Bolivia.

53. Exhaust fan and blowers, for dust of battery and roll, and blowers for boilers and gas producers. Bolivia.

54. Stamp mill, 100 stamps, 1,000 pounds each, in 10 batteries, complete. Steel cams, tappets, heads, shoes and dies, iron frames, charcoal, iron or steel motors. Bolivia.

55. Two 10-inch by 20-inch Blake crushers, four 6-inch by 20-inch Blake crushers, five pairs of 36-inch by 14-inch rolls, one salt dryer, revolving cylinder, 5 feet by 30 inches; four ore dryers, revolving cylinder; four ore conveyors, 50 feet long by 24 inches diameter, revolving pipe. Bolivia.

56. Eighteen rock drills with posts, arms, tripods, etc., complete. Bolivia.

57. Surface condenser, 4,000 square feet cooling surface, tinned brass tubes, independent direct acting pump. Bolivia.

58. Melting works—two 3 by 8 feet by 15 feet high Raschette water jacket blast furnace, one 36-inch round furnace, 15 feet high. Complete with slag pots, movable well, two cupel water jacket furnaces, three slag roasting furnaces. Bolivia.

59. Roasting furnace, for chloridizing; roasting 150 tons a day (5 per cent antimony, 35 per cent sulphur).

60. Amalgamating pans, etc., or tins, thirty 6 feet dia., fifteen 10 foot settlers, three clean-up pans, two quicksilver pumps, two agitators, one amalgam. press, retorts for 6 tons amalgam. per day, line shafting and pulleys. Bolivia.

61. Gas producer, ten, for soft coal; each to burn 2 tons in 24 hours. Bolivia.

62. Mine cars—20 steel mining cars to carry 13 cubic feet; 14 inch-steel wheels and steel axles. Bolivia.

63. Rope, 5 by 318 flat, crucible steel. Bolivia.

64. Wheelbarrows. Bolivia.

65. Wooden houses for workmen, fifteen, each with 2 rooms, 12 feet by 18 feet, with 10 foot by 12 foot kitchen. Fifteen with 2 rooms, 13 feet by 18 feet. One boarding house, 30 feet by 60 feet; single story. Bolivia.

66. Office and house furniture. Bolivia.

67. Carts for transporting metal, with hickory wheels and iron box of a capacity of 8 to 9,000 lbs., such as are used for this purpose in Colorado and Nevada. Bolivia.

101. Lager Beer; will take 1,000 bbls. a month during hot season. No house wanted now represented in the Colonies. Melbourne, Australia.

102. Brickmaking Machinery, capacity not specified. Sydney, New South Wales.

103. Kerosene Oil is wanted by a house having branches throughout Australia.

104. Canned Foods—salmon, oysters and fruit. Melbourne, Australia.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including July 17th, as reported by the Marquette *Mining Journal*, were as follows:

	Tons. 1889.	Tons. 1888.
Marquette, Marquette District....	627,148	218,330
St. Ignace, " " ..	21,772	50,262
Escanaba, "	421,892	322,635
" Menominee District....	718,074	388,783
" Gogebic District.....	117,322	90,933
Ashland, "	589,072	330,645
Two Harbors, Vermillion District.	363,286	106,877
Total, tons.....	2,858,566	1,508,465

It is stated that the principal coal companies of Kentucky and Virginia have formed a gigantic combine involving $3,000,000 capital and 4,900 acres of coal land.

There is reported to be a movement to consolidate all the natural gas companies in the Ohio and Indiana field, and to put them into a trust. It is understood that this arrangement has the sanction of Calvin S. Brice, Oliver H. Payne and other Standard Oil magnates. They now own the majority of all the stock of the companies in Ohio and Indiana, and will buy up the stock of the remaining independent companies.

ARIZONA.

YAVAPAI COUNTY.

DIXIE MINING COMPANY.—This company, in which Kansas City parties are largely interested, has recently erected quite a large mill at the mine, and is said to be taking out ore in paying quantities.

CALIFORNIA.

LOS ANGELES COUNTY.

Great developments are being made at the Puenta oil wells. Number 12 promises to run from 45 to 50 barrels a day after the "head" is worked off and it settles down to steady business. Number 14, the last well on the list, is now down 190 feet. It will have to be bored to between 800 and 1,000 feet to find oil, if the stratum dips as it is supposed to at the point where the hole is being made. Number 9 has given up a good quantity of oil each day since the pumps were set at work in it, many months ago. It is down to a depth of 930 feet. The drills are now at work sinking the hole to a lower level.

NEVADA COUNTY.

EAST IDAHO MINING COMPANY.—Work is to be commenced on the East Idaho claim shortly. 30,000 shares have been set aside as a working capital, and 10,000 shares are to be placed on the market at $1 a share. An assessment of one-half cent a share has been levied. The following directors and officers were elected: Edwin Tilly, President; J. E. Carter, Vice-President; Geo. Fletcher, Secretary; Geo. G. Allan, Treasurer; R. C. Walrath.

SHASTA COUNTY.

NIAGARA MINE AND MILLING COMPANY.—It is reported that William T. Coleman has sold his interest in this company to an English syndicate for $2,000,000. Abstracts of title to a group of sixty mines, twenty of which are patented, are under way in the abstract bureau at Redding. The new owners will push work vigorously.

COLORADO.

The new ore rate determined by Arbitrator Newman went into effect July 24, that date having been agreed upon by the railroads and the smelters. After that date Leadville ore will be hauled to Denver for $4.25 per ton, as against the present rate of $4.80, a saving to the valley smelters of 55 cents per ton. The rate will remain in force for two years, this time being agree upon before the matter was submitted for arbitration.

CLEAR CREEK COUNTY.

CHAMPION.—In addition to the present extensive operations at this mine, the shaft, which is now 800 feet deep, will be sunk another 100 feet. This will make it the deepest mine around the district outside of the Freeland. The 50-stamp mill is kept in operation night and day on ore from the mine. A bridge has been erected over Clear Creek opposite the mill, where the concentrates are loaded on the cars of the C. C. R. R. and are shipped direct to the smelters at Denver.

CUSTER COUNTY.

GEYSER MINING AND MILLING COMPANY.—A meeting of this company will be held at Silver Cliff, Aug. 10, at 2 o'clock P. M., to see if the stockholders will vote to mortgage the property of the company, to secure its bonds to the amount of $30,000 or upward, or to secure any loan to the company, or to act in any manner relating thereto.

GILPIN COUNTY.

SILVER AGE MINING COMPANY.—It has been decided to construct a tramway from the mines to the mill and railroad, which will be a saving of about $100 per day in the cost of transportation of ore. An electric plant will also be put in for operating the machinery and lighting the mines and mill. It is expected that the improvements authorized will be completed within three months. The policy of the company is to push the work as rapidly as possible at the least expense. A strike of considerable importance was made in the fifth level west, a streak of gray copper ore coming in from the foot wall. The mill is crushing ore as fast as the teams can haul it down.

GUNNISON COUNTY.

RUBY CHIEF MINING COMPANY.—No work will be started on this group of mines this year, owing to the fact that the litigation cloud under which the property has been, caused by M. A. Hawkes, has not yet been raised. Leases can be had on any of the properties with the exception of the Ruby Chief mine.

SYLVANITE MINING COMPANY.—The tunnel has been started under instructions from W. S. Baker. A force of twelve men is at work, and will push work with the steam drill.

LA PLATA COUNTY.

(From our Special Correspondent.)

Durango is rapidly recovering from the disastrous fire. The result will be that the main street of the town will have a much improved appearance when the contemplated buildings are erected, as the old frame structures were very unsightly, as well as being nothing but fire traps. So far as the business portion of the town is concerned, the fire will prove a benefit, as fully three-fourths of the value is covered by insurance. The heavy loss is among the residences. Mr. Amy, assistant manager San Juan Mining and Smelting Company, by strenuous efforts succeeded in keeping his fine residence unscathed.

PITKIN COUNTY.

[From our Special Correspondent.]

No mining stock will sell readily where mine managers refuse frequent periodical statements for publication. The mining columns of local papers invariably represent the reports of irresponsible persons. None but official reports should be accepted; a thorough weeding-out of all that is imaginary is absolutely necessary.

BEST FRIEND.—The Director of the Mint omitted the annual production of the Best Friend Mine, amounting to $48,000.

CAMERON.—A contract to sink the present incline 100 feet has been let. The incline has a dip of about 50 degrees, driven in a northerly direction.

FRANKLIN.—The reported strike in the lower workings of the Franklin, 125 feet below the 5th level of the Veteran tunnel, proved to be a pocket of high-grade ore, assaying from 100 to 900 ounces silver.

SUMMIT COUNTY.

JUMBO MINING COMPANY.—The committee appointed at the meeting of this company, to devise a plan for the reorganization of the company, have submitted their plan, which will shortly be acted upon by the stockholders. In the meantime the property will be sold under judgment. A reorganization will follow, and the laborers at the mine and those who furnished supplies are to be provided for.

WIRE PATCH GOLD MINING AND MILLING COMPANY.—This company's property is located on the western slope of the Farncomb Hill and consists of 70 acres of patented ground, of which there are seven lode claims and the balance placer ground. Upon this property there has been considerably over 1,500 feet of development work done aside from the open cuts. The stock is being dealt in in St. Louis, Mo., where two-thirds of the stock is owned, and the remaining one-third is owned by Denver capitalists.

DAKOTA.

LAWRENCE COUNTY.

BLACK HILLS MINING COMPANY.—The Grizzly Bear and Gold Safe gold mining properties, which recently passed into the possession of this company are being operated actively under the management of Herbert Strickland, M. E., Superintendent. Automatic feeders and other new machinery are being put into the old twenty stamp gold mill, a new tramway for delivering ore from the mine to the mill is being laid, also a main working tunnel is being run to open the mine down to near the water level, and various other improvements are being made.

BIG MISSOURI.—A thorough development of this mine has been decided upon by the owners of the property, to which we referred in our issue of June 29th, the late test of the ore at the Pluma mill being highly satisfactory. Arrangements are being perfected for the reduction of its output.

DEADWOOD CONSOLIDATED MINING AND MILLING COMPANY.—The directors of this company at their last meeting levied an assessment of $1 per share on the stockholders. It is said to be the intention of the company to build works for the operation of the Newberry-Vautin process.

HARMONY MINING COMPANY.—At Garden City the Keystone chlorination plant is successfully treating the ores from this company, in Ruby Basin. The first lot of ore sent there was taken from what they call the second grade dump, average assay value being between $21 and $22 per ton. The ore now being delivered is of better grade, its value being $35.

IRON HILL MINING COMPANY.—This company has recently hoisted some high grade ore. Some of it shows horn silver. The smelter will be started up about August 1st if sufficient ore is on hand to warrant the management in doing so.

ILLINOIS.

The miners who testified before the Board of Arbitration which met at Streator during the week, all concurred in the statement that the averages earned by the men were less than $30 a month, and that after the necessary deductions were made there was not enough remaining to constitute a fair living.

CHICAGO, WILMINGTON AND VERMILLION COAL COMPANY.—The announcement is made that owing to the strike which has continued since this spring the August dividend of this company will be passed.

KANSAS.

SHAWNEE COUNTY.

Discovery of a bed of terra cotta clay near Topeka is reported. Beds in New Jersey and Ohio have, prior to this time, furnished all the terra cotta works with clay.

MICHIGAN.

The Peninsular Electric Light and Power Company has decided to commence work on its Lake Linden plant immediately. The Thomson-Houston Electric Company has accepted the $50,000 bonds of the local company, and the funds to defray the expenses of constructing the new plant are thus secured. The work of building a dock on the shore of Torch Lake, adjoining the lately acquired property, has been commenced. Within the next ninety days the plant will be equipped and ready to furnish light to Lake Linden, Calumet and Red Jacket.

BARAGO GRAPHITE MINING COMPANY.—This company, which owns the Barago mine to which we referred in our last issue, has recently been reorganized and is now ready for business. Prospects for selling the product are good. The Cleveland Facing Company, of Cleveland, Ohio, after purchasing a car load and giving it a trial, has contracted for a two years' supply. There are about 200 tons of the graphite now in the dump at the mine and about 60 or 70 have gone to Detroit or Cleveland. The company is grinding at Detroit every day, the mill, which has been built for experimental purposes, having a capacity of 1,500 pounds per day, being only intended for samples. They have made arrangements to draw the 200 tons now on the ground to the railroad and have it shipped to Detroit. The company now desires to contract to strip or uncover the mine.

CLARA MARBLE COMPANY.—A carload of marble from the quarry of Messrs. Menz & Weatherston, now known as the Clara Marble Company, at Ishpeming, has been shipped to Chicago where it will be cut into different shapes and polished. This marble is of splendid texture and takes a handsome polish. The prevailing color is green, the light and dark shades making a beautiful combination. Operations will be resumed at the quarry again as soon as this carload of rock now on the way can be put into the desired shape so that sales can be effected.

LAKE SUPERIOR SHIP CANAL, LAND AND IRON COMPANY.—The suit for ejectment of this company against Walter Cunningham, pending in the United States Court, involves the title to a large amount of land claimed by said company under a grant from the government, which is disputed upon the ground that the government had granted the same land a few years previous to railway companies. There are thirty similar cases before this court, but the case cited has been selected as a test case.

COPPER MINES.

CALUMET & HECLA MINING COMPANY.—The work of drilling holes from the surface into the Calumet mine is still going on. At present the drilling machine is stationed near to the Blue Jacket suburb of the village, where a hole 800 feet deep will be bored. It is the intention of the company to work the underground pump by electricity to avoid the heat that is incurred by the use of steam pipes.

IRON MINES.

ARAGON.—Work has been begun on the Menominee range, which is to iron mining what the sinking of the first shaft of the Tamarack mine was to copper mining. It will require at least two years to sink the Hamilton shaft, and a depth of nearly 2,000 feet will be attained before the ore body is encountered. The shaft, work on which was recently begun, will be of full working size, and its sinking will require the expenditure of a large amount of money. Ore has been struck in a cross-cut from the shaft on this property at Norway, on the Menominee range. This shaft was projected over two years ago on the town site of Norway, and sinking was begun in 1887. A large amount of money has been sunk in this property, but the vein of ore cut recently is said to be of sufficient size and purity to make it probable that the money invested will give good returns.

EAST JACKSON IRON MINING COMPANY.—It has been decided to carry on that work of opening up and exploring which had been previously mapped out, and an assessment of 25 cents a share has been levied for the purpose of prosecuting this work. At the last reports the hematite ore body which was discovered lying toward the Jackson had been penetrated nine feet, and the drift had gone in an additional four feet, with an indefinite thickness of deposit remaining.

PITTSBURG AND LAKE SUPERIOR IRON COMPANY.—When this company sold its mine at Palmer, together with a large amount of mineral land that it owned in the county, to Gen. Alger, it did not by any means propose to go out of the business of mining iron ore. The company retained possession of several thousand acres of mineral lands, and it at once began exploring on these with the intention of opening up and working some of the iron deposits. This work bids fair to prove successful at an early date. The company has just cut a 24-foot vein of ore on section 29 with the diamond drill. The extent of the deposit is yet to be determined.

MINNESOTA.

ST. LOUIS COUNTY.

CHANDLER.—The iron ore shipments from this mine in the Vermillion District up to the 17th inst., have amounted to 141,397 tons.

PIONEER.—This mine in the Vermillion District has begun shipping ore, its first cargo, amounting to 1,047 tons, having gone forward from Two Harbors during the week ended the 17th inst. The Pioneer is a neighbor of the Chandler, and will send considerable ore to market during the remainder of the season.

MONTANA.

GALLATIN COUNTY.

LIVINGSTON COAL AND COKE COMPANY.—This company has nearly finished the forty additional ovens under construction, and contemplates the erection of twenty more, work upon which will be begun shortly. When these are completed it will make a plant of 100 ovens, and necessitate an increase in the number of men employed to at least double the present force.

SILVER BOW COUNTY.

At a recent meeting of owners of the Pollock and Glengarry it was decided to separate the two mines, and they will be operated as separate concerns hereafter. The Glengarry will be in charge of Carney & Hand from now on. The property has five different veins, only two of which are of any size. The mine has produced over 72,000 ounces of silver, and has

been worked 300 feet on one of the veins at a depth of 150 feet. The richest ore in the mine was explored by winze, and so far as developments have shown it is richer and larger below than above. It is proposed to stock this mine for $100,000, in shares of a par value of $1 each, and to place 50,000 shares on the market at 50 cents each for working capital.

A proposition is on foot at Butte to sink a four compartment shaft below Main street, and to a depth of several hundred feet, for the purpose of mining the bodies of high grade ore which are known to exist in the Smoke House and Destroying Angel lodes. Other lodes contiguous could also be worked from the same shaft, and in time all the copper and silver ores could be extracted, by means of drifts and cross-cuts, which are now underlying almost the entire side of the mountain.

BUTTE AND BOSTON MINING COMPANY.—Mr. C. H. Palmer, the superintendent, has returned to Butte from a two months' trip to the East. He stated that the Butte & Boston Company will at once erect a furnace with a capacity for handling about one hundred tons of ore. The furnace to be erected, as already mentioned in our issue of July 6th, will be put up somewhere near the Silver Bow mill, and work on it will be begun immediately. The object of this is to handle the ore taken out in the development of the company's properties, especially the Silver Bow shaft

CLIMAX MINING COMPANY.—The property, real and personal, of this company, is now in possession of the sheriff, by virtue of a writ of attachment to secure claims held against the company by W. M. Jack, H. A. D'Acheul and the Montana Iron Works. The bills held by the three parties amount to about $6,000, and were incurred for supplies furnished in the construction of the company's mill and the development of its claims.

NEVADA.

STOREY COUNTY—COMSTOCK LODE.

We condense the following from the Virginia City *Chronicle:*

A meeting of the Comstock mine superintendents and other prominent residents of the lode was held in Virginia City recently to protest against the diversion of the Carson River flow from its channel during the dry season, thereby seriously curtailing the bullion yield of the mines, and throwing out of employment hundreds of miners. A committee composed of E. D. Boyle, Chairman; H. M. Gorham, D. B. Lyman, and W. E. Sharon presented a preamble setting forth these matters and the following resolutions, which were unanimously adopted:

Resolved, That this community representing 15,000 people dependent entirely upon the mining industry, the prosecution of which in turn is almost wholly dependent upon the continued running of the quartz mills on the Carson River, appeals to the farmers of the Carson Valley, a community comprising not more than 700 people, and largely dependent upon the prosperity of this community for its market, to respect the just rights of this community to the full use of the Carson River during the dry season.

Resolved, That this community, while conceding the rights of appropriators in the Carson Valley to the reasonable use of the surplus waters in the flood season, the same being sufficient to bring to maturity the first crop, claims that its existence and prosperity depend upon the assertion of its rights to the full flow of the Carson River during the summer and fall and season following the middle of June, as the same is necessary to the prosecution of mining.

Resolved, That if the farmers of the Carson Valley persist in their trespass on the rights of this community, that legal proceedings be immediately instituted to assert and enforce such rights.

The discussion of the water question disclosed that there is at present a flow of fully 5,000 inches in the Carson River, which, if not diverted from its natural channel to run to waste on worthless lands, is more than ample to operate throughout the summer months all the stamps in mills along its course.

ALPHA CONSOLIDATED MINING COMPANY.—This company proposes to sink its shaft 90 feet deeper and connect with the Imperial workings.

SAVAGE MINING COMPANY.—At the annual meeting of this company, held in San Francisco on the 18th inst., the following officers were elected: H. M. Levy, President; A. K. P. Harmon, Vice-President, and Morris Hoeflich, Herman Zadig and E. B. Holmes, trustees. The only change in the board was the election of Herman Zadig in place of Archie Borland. E. B. Holmes was re-elected secretary and R. P. Keating superintendent. Secretary Holmes' statement of receipts and disbursements for the past year showed that the present indebtedness of the company is a cash overdraft at the bank of $43,868.10, The superintendent's report stated that during the year a great deal of labor had been required to keep the several drifts and stations in repair, also in easing and retimbering the main vertical shaft, all of which are now in good condition. The mine has produced 19,055 tons of ore, which yielded $248,279.65 in bullion. The hoisting works, machinery, etc., are all in excellent working order. At the meeting a committee composed of W. N. Griswold, Theodore Fox and others filed a protest, stating that under the present system of milling less than 35 per cent of the assay value of the ores was returned to the company, and that hereafter all contracts to mill ores shall be made in writing, and that the millowner shall be required to return at least 70 per cent of the assay value at the mine. The protest was placed on file, and the protestants were assured by the president of the company that everything possible had been and would be done to get as high a percentage from the ore as possible, and if it could be shown where it could be worked to better advantage than it had been, a change would be made. At present no ore is being milled. The statement that less than 35 per cent of the assay value of the ore had been returned to the company is not borne out by the facts. The percentage has not been less than 60 or 62 per cent, and it has averaged fully 65 per cent.

UNION CONSOLIDATED MINING COMPANY.—At the annual meeting of this company, held in San Francisco recently, the following officers were elected: Robert Sherwood, President; C. H. Fish, Vice-President; C. Hirschfeld (vice W. S. Hobart, resigned), Herman Zadig and W. S. Lyle, Trustees; J. M. Buffington, Secretary; D. B. Lyman, Superintendent; and the Nevada Bank, Treasurer.

YELLOW JACKET MINING COMPANY.—The annual meeting of this company was held at Gold Hill on the 15th inst. The following officers and trustees were elected: President, J. W. Eckley; Vice-President, George D. Edwards; Treasurer, Robert Morrow; Superintendent, William E. Sharon. The Yellow Jacket is the only leading mining company on the Comstock incorporated under the laws of Nevada and holding its annual meetings of shareholders in this State.

NEW MEXICO.

GRANT COUNTY.

It is stated that the leasing and contract system is coming into favor at Pinos Altos, and instead of employing miners at $3 to $3.50 per day, the big companies are favoring contracts at fixed amounts per foot for work in shafts, tunnels and drifts, and in some cases miners are paid by the ton for taking out ore. Other mines are being operated on the leased system, the owners of the mines getting a certain percentage of the ore taken out by the miners.

PACIFIC GOLD COMPANY.—This company has let a contract for 400 feet of work on its tunnel at Pinos Altos. The company now has a large amount of ore in sight, and is pushing development work in the mine vigorously, so that a supply of ore to run the mill may be easily obtained. The company has commenced hauling ore from its mines to the new twenty-stamp mill which is now in perfect running order.

PACIFIC MINING COMPANY.—The new 20-stamp mill of this company has started up. Only 10 stamps will be run for a few days, to allow the teams now hauling ore to catch up As more teams are secured, all the stamps will be put in operation.

SANTA FE COUNTY.

It is stated that the Lucky and the Lincoln mines have been sold to the owners of the Colorado reduction works at Pueblo for $250,000.

OREGON.

BAKER COUNTY.

BASILEY.—This mine has been sold to Col. R. F. Looney, of Memphis; Judge R. E. Reese and O Szontagh, of San Francisco. The other members of the company are Eastern capitalists. This mine is one of the finest gold properties in the Northwest. The company will put a large force of men to work at once. Colonel Looney, R. E. Reese and O. Szontagh start East to-morrow for the purpose of ordering machinery for the mine.

PENNSYLVANIA.

COAL.

BEECH CREEK COAL COMPANY.—It is reported that a representative of the Vanderbilts on the 23d inst. purchased the interests of a number of heavy local stockholders in the Beech Creek Coal Company. The Vanderbilts are now said to be sole owners of the Beech Creek Railroad.

CENTRAL.—This colliery, owned by the Delaware, Lackawanna & Western Railroad Company, in the western section of Scranton, was the scene of a double disaster on the 24th inst., the first being an extensive cave in, which occurred at 5 o'clock that morning, doing great damage to surface property and destroying many dwellings, and the second an explosion of firedamp, which took place that afternoon, killing two miners outright and seriously injuring five others.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to July 20th:

	1889. Gals.	1888. Gals.
From Boston	2,713,673	1,696,592
Philadelphia	70,650,455	62,738,364
Baltimore	1,898,349	3,773,922
Perth Amboy	10,741,527	12,922,174
New York	226,958,523	191,703,122
Total exports	312,962,527	272,879,174

UTAH.

BEAVER COUNTY.

HORN-SILVER MINING COMPANY.—The following statement, for three months ending June 30th, has just been issued by the company:

April 1st—Cash balance, per last quarterly report		$174,408.89
Receipts.		
Sales of ore:		
April	$7,640.80	
May	28,175.42	
June	28,644.55	
		64,460.77
Horn-Silver store:		
Surplus funds		5,000.00
Francklyn Smelter:		
Net proceeds of sale of scrap iron, slag, iron ore, coal, etc., sundry rents, etc		2,575.37
		$246,445.03
Disbursements.		
Mining:		
Labor, supplies, timbering, dead work and expenses		$22,492.19
General expenses:		
Manager, Treasurer, clerks, etc., Frisco and Salt Lake City		1,869.10
New York office:		
General and office expenses	$262.99	
Salaries and clerk hire	250 00	
Registration of stock	200.00	
Printing and stationery	131.60	
Rent	100.00	
		944.59
Total working expenses for second quarter.		$25,305.88
Balance cash on hand:		
United States Trust Company, New York City, drawing interest	$210,000.00	
First National Bank, N. Y. City	8,876.06	
J. T. Little, Salt Lake City	2,094.36	
F. Honkamp, Chicago Refinery	154.85	
Petty cash, New York	13.88	
		221,139.15
		$246,445.03

A. C. WASHINGTON, President.

SUMMIT COUNTY.

The local papers state that the absence of a custom smelter in Park City is sorely felt, but a year hence will make it absolutely necessary that this need be filled.

WEST VIRGINIA.

KANAWHA COUNTY.

WEST VIRGINIA & KANAWHA RAILROAD.—This railroad company has been organized in West Virginia, with a capital stock of $200,000, to build a railroad in Kanawha County to reach various coal mines.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

CANADIAN ANTHRACITE COAL COMPANY.—The sale of the company's lands to a British syndicate is reported. The lands sold consist of 7,000 acres in the vicinity of Anthracite and Banff in the Northwest Territories. The purchase price is said to be $1,450,000, of which a large part has been deposited in the Bank of England. The sale was negotiated by Mayor Stewart, who has been in England several months on this errand.

CANADA.

PROVINCE OF NOVA SCOTIA.

COLCHESTER COAL MINING COMPANY, LIMITED.—This company, which has been developing its property on North River, above Onslow, is reported to have met with evident success. Two veins of coal, free from shales or slate, have been found.

PROVINCE OF ONTARIO.

HURONIAN MINING COMPANY.—The fire at this company's property has destroyed all the buildings and valuable machinery. The same fire destroyed all the fine timber on the Lac de Mille Lac, between the Narrows and Barrel Portage.

SULTANA.—This gold mine, in the Lake of the Woods district, is reported to have been sold to Glasgow capitalists, and will be immediately developed.

WEST END MINING COMPANY OF ONTARIO, LIMITED.—This company has been organized to do business in Whitefish and Silver Mountain mining regions, with headquarters at Port Arthur. The capital stock is $2,000,000, and the incorporators are Herbert Nelson Nichols, Frederick Morse Newberry, Thomas Ambrose Gorham, Oliver Daunais, and H. Kingsley Nichols, superintendent.

The asbestos industry continues to rapidly increase in importance, and at all the mines operations are going ahead briskly. It is thought from present indications that the output of this mineral from the various districts will be largely in excess of former years. The demand for the product continues strong, and many manufacturers being unable to obtain their supply of firsts, have to be content with second and third qualities.

PROVINCE OF QUEBEC.

[From an Occasional Correspondent.]

Asbestos mines at Thetford, Black Lake, and Coleraine, Megantic County, on the line of Quebec Central Railway, are in full blast. Over 500 men, with the most improved machinery, are taking out large quantities of ore of the very best quality. The price of the material is increasing and demand the cannot be supplied. These mines are paying over two hundred per cent profits on the actual workings. Ore is sent to United States, England, France, Germany, and Italy.

Since the price of antimony has so materially increased, the antimony mine at South Ham, Province of Quebec, near the Quebec Central Railway, is being opened up; some very rich ore is being taken out. It will pay to work the mine if present high prices continue.

INDIA.

THE BURMA RUBY MINES.

In a late issue we made some mention of a recen incorporation in London of the ruby mines of Burma. We are now informed that this company pay the Indian government a rental of $125,000 per year for the privilege of working them, and active operations on a much larger scale are at once to be inaugurated. The new company proposes to put in the most improved mechanical appliances and work them in a more scientific and systematic way.

The specific gravity of the stones being about four times that of quartz admits of their being saved by washing, and the California system of sluicing is now to be adopted. Another California invention has also found place in the new system of working the Pelton Water Wheels, a large order having recently been received by the company in San Francisco for running pumps, hoists, electric lights, etc., which shipment goes direct via China.

MEXICO.

TLALPUJAHUA.

CONCEPTION MINING COMPANY.—The reorganization of this company, as outlined by the board of directors, has fallen through, owing to the fact that the plans were not satisfactory to a majority of the stockholders. A new scheme has, however, been formulated, the idea being to recapitalize the company on a basis of 60,000 shares at $1 a share, the stockholders to be given the privilege of turning in the old stock on a pro rata or of receiving the new or else subscribing outright for the stock as they see fit.

(Special Report by R. E. CHISM, M. E.)

CHIHUAHUA.

The La Fortuna Mining and Milling Company has been formed in Denver, Colorado, with J. H. Milliken as managing director, to work the La Fortuna mine in the district of Morelos.

In this State every one is expecting that the U. S. Treasury will decide that silver-lead ores going into the United States will have to pay duties, so that there is a regular boom in the smelting interest. The old Chihuahua smelter is being remodeled, and arrangements have been made for the erection of two more smelters as soon as there is a definite conclusion arrived at in the matter unfavorable to exportation.

From Sabinal the Santo Domingo continues to ship ore to El Paso at the rate of thirty tons a week. The Lourdes mine, owned by Mexican parties, is being vigorously worked, as is also the Florenza mine, now in the hands of El Paso parties. The El Toro mine has improved greatly and turns out some tons of rich ores, with a great deal of native silver.

Ascencion is a camp located about thirty miles north of Sabinal, where new and apparently important discoveries have been made of silver-lead ores with silver bearing iron oxides and quartz containing gold. There are said to be miles of mineral field here awaiting the advent of prospectors. Mexican miners are actively at work in several places, and companies are being formed to work the principal mines, such as the Progreso, Nueva Espana, Porvenir, Flor de Mayo and Bismarck.

The Guazapares mines are situated in the State of Chihuahua, a few miles to northwest of Batopilas. They have a concession containing seventeen mines, which was granted to Ptacnick, of Chihuahua City, and Stalforth, of Parral. There is said to be a large amount of milling ore, running from $25 to $45 per ton, from which the owners say that they produced $250,000 in two years with a ten-stamp mill. This property is now said to be in the hands of a powerful Chicago syndicate, of which Mr. Edgar Holmes is a leading member. This company has made tests of the ore on a large scale, and now has parties at work designing a mill, to be put up as soon as possible. The new plant will work sixty tons of ore a day by amalgamation with leaching of the tailings.

COAHUILA.

Twelve coke ovens have been erected at Sabinas to make coke from the coal of the Alamos and Hondo mines belonging to the Coahuila Coal Company. This coal is claimed, on the authority of "analytical chemists of Richmond, Virginia," to contain 88 per cent of combustible matter, "being a greater per cent than is found in the coal of any of the mines in the United States," which seems to be a big assertion.

The coke remains in the ovens 24 hours and then comes out strong and porous. The first of the product has been contracted for by the Iron Mountain Iron Company of Durango, but a larger number of ovens will be soon in use so as to supply the open market.

The evaporative power of the raw coal, according to a test made on the International Railroad, is 6·6 pounds of water to one pound of coal.

A new coal mine is said to have been recently discovered, by Ismael Galan, at Mota del Cura, a point some twenty miles to the west of Sabinas.

At Viesca the salt beds, the remains of ancient lakes, which are numerous in that locality, are now being actively exploited, an impulse having been given to this industry by the cheap freights on the railroad near by.

DURANGO.

The La Misma Milling and Mining Company, of St. Louis, Mo., is operating the mine of that name at Mapimi, under the direction of Mr. R. Elmore, and is putting up machinery to work the ores.

The French house of Luis Veyan & Co. has commenced the work of putting up a large cotton factory at Torreon Station, where the International Railroad from Piedras Negras (Ciudad Porfirio Diaz) joins the Mexican Central Railroad, and in the midst of the Mexican cotton belt. The ironwork for the edifice, which will be of vast proportions, is to be made by the Iron Mountain Iron Company, of Durango City.

The center of the tin region of this State is the small town of Coneto. This is about 120 miles nearly due west of the station of Villa Lerdo on the Mexican Central Railroad. The town lies at the foot of the San Francisco mountain chain. This is a spur of the Sierra Madre, and carries tin ore toward its southwestern end. The peaks, valleys and gulches are seamed in all directions by veins of eruptive granite, carrying cassiterite of great purity, ranging in color from light brown to black. At the foot of the ridges there is usually a placer of tin proceeding from the meteoric erosion above. In the veins the ore occurs in streaks and nodules, and is readily separated from the gangue. The veins are said to be very numerous, and it is asserted that only a small proportion of those that exist have been discovered or prospected.

HIDALGO.

According to an official announcement Messrs. W. B. Murdoch and Persifor Frazer have located before the Mining Deputation of Pachuca an "adventurer tunnel." This is to commence in the cañon of the Venta River to the northeast of the town of Pachuca and will run towards and under that town. It will be over five miles long and will pass at a depth of 2,300 feet below the level of the public square of Pachuca. This tunnel and some lateral branches will, according to the project, drain all the mines of Pachuca, Real del Monte, Santa Rosa and the other districts in the neighborhood.

There was a terrible storm some weeks ago in the El Chico district. On the land belonging to the mine of San Antonio el Rico the rushing waters carried away an embankment, part of a waste dump that had existed there from time immemorial, and uncovered a silver vein about eighteen inches wide which assays over 200 ounces per ton.

This same mine of San Antonio has been doing very well lately, its average weekly output being neary 50 tons of ore, carry 65 ounces of silver per ton.

The Laguna mine, in the same district, is now under the direction of Mr. H. Prideaux, who is said to have done more work in one month than had been done in the ten years previous. As the result of all this energy the mine is now producing a fair quantity of ore, and the signs show that a large body of ore will probably be met with near to the foot wall in one of the crosscuts being driven across the lode.

There six large haciendas in the El Chico district, all at work, with plenty of ore.

JALISCO.

The German Consolidated Mining and Smelting Company, of St. Louis, is negotiating for some gold mines in the Sierra of Tapalpa, which are said to be very rich.

MEXICO.

I have the following from a correspondent whose interesting letter has been for some time overlooked in the press of other business:

Sultepec and her neighbors, Temascaltepec, Valle de Bravo, Tijupilco, Chiltepec, Amaltepec, Tlaclaya and El Cristo constitute a large and meritorious district. In Suitepec there are two American companies doing good work. The oldest of these, owning the Hacienda de Guadelupe, has been for three years under the direction of Col. H. D. Mackay, who has considerably modernized and in many ways improved a very old-established smelting works.

The newer company, which is represented by Mr. Adolph Rock, has recently purchased the Malacate group of mines, which are now being developed for a big output.

There is in the same camp the Hacienda de los Arcos, owned and operated by the Stein Bros. They have seven stone smelting furnaces, which are constantly at work on custom ore. There are three small haciendas with adobe furnaces, and two "rescates" or ore-purchasing establishments, so that the "buscon" or ore-seeker element is kept pretty busy. As a matter of fact, there are more than thirty mines in successful operation depending on these establishments for the disposal of their ore.

The Cancbal mine in Sultepec was formerly the leading one of the camp, but for many years past it has been worked only by "buscones," and is, consequently, in very bad condition. It has, however, lately been bonded by the New York and Temascaltepec Mining and Smelting Company, at present running the Hacienda de la Presa in Temascaltepec. As soon as a correct survey can be made of the property, the necessary development work will be commenced with a view to putting the mine on a footing even better than of old.

The Presa hacienda, in Temascaltepec, just mentioned, and the business of the company are managed by Mr. S. H. Finch. The hacienda is a model in a small way. It already has a ten-ton Fraser and Chalmers water jacket furnace, and preparations are in hand to triple its capacity.

The Elvado furnace, in the same place, belongs to A. Jacot, of Mexico City, and is said to be doing well under the management of Mr. Alexander Piaget.

The Valle de Bravo camp has an iron foundry and blast furnace which, though small, does good work.

The other camps mentioned have also very good mines, but need some outside capital to set them on their feet.

OAXACA.

A metalliferous deposit has been discovered in the mountain near the town of Vigallo. The bulk of the product is gold quartz, but there have also been numerous samples of native silver taken out in the form of palm leaves, which are said to imitate that foliage as closely as could be done by a cunning artificer.

LOWER CALIFORNIA.

Advices from Lower California state that the Chinese syndicate who have brought a half interest in the Masac concession regard the ore in the Real mine as looking well, and miners will soon be put to work there, receiving as wages from $2 to $3 per day. The Chinamen are already talking of importing laborers direct from China to Ensenada by the projected oceanic line to be put on by Claus Spreckles, the sugar refiner. The syndicate have also bargained for extensive tracts of land to be used for market gardens and for valuable fishing privileges along the coast of the peninsula. All this will necessitate an investment of no less than $1,000,000 of Chinese capital. This will include the amount paid for the Real del Castillo mining property, the garden lands near Ensenada, the colony property, the seal and shell fisheries, and the more valuable pearl fisheries at the southern end of the peninsula.

The International Company, of the mines of which Mr. F. T. Sutherland is superintendent, has prospected twenty-five claims at Alamo by sinking shafts, running drifts and opening cuts on each one from 20 to 50 feet, and at least ten can be called first-class prospects. The San Diego *Union* says: Many would call them mines without further development, as the ore now on the dumps will testify to their value. There are at least twenty-five good paying properties in the camp, the veins running from 1 foot to 10 feet in width, and every one, without exception, that showed good prospects on the surface has improved with depth and development. Among the most prominent mines might be mentioned the Scorpion, owned by McGrath & Antonia; the Texas and El Paso, owned by Owens & Bain; the Elsinore, owned by Elsinore parties; the Rainbow, owned by Frey, Jackson *et. al.*; the Asbestos and others, owned by Huff, Agramonte *et. al.*; the Telemico, Princesa, Ulyses, Cocinero, Spider, San David and others, owned by the International Company; also, the Aurora and Alamo, owned by Pedro, Lopez & Gonzales; the Tarantula, owned by McCarty and the Torres Mining Company, with the different mines owned by Mr. Butler, and many others. There are several first-class prospects owned by Lucas & Blethen. There are now in operation Butler's mill of five stamps, and the Torres mill of five stamps, with power for fifteen, the balance now on the way. The International Company will soon have a plant of 20 tons daily capacity, with four concentrators; also two steam hoisting and pumping plants. The company will also put in a saw mill to furnish mining timbers for all the mines. Mr. James Randall is the superintendent at Ensenada, and will manage the saw mills. The town site of Alamo is finely located, with water-works nearly completed. A tri-weekly stage line from Ensenada, making the trip in twelve hours.

The company is causing roads to be built to the mines, and is doing everything in its power to further the interests of the country. In the ENGINEERING AND MINING JOURNAL of March 23d we published a description and map of the Santa Clara Mining District.

MEETINGS.

Live Oak Drift Gravel Mining Company, 328 Montgomery street, Room 24, San Francisco, Cal., August 20th, at two o'clock P. M.

DIVIDENDS.

Boston & Montana Consolidated Copper and Silver Mining Company of Montana, dividend No. 5, of $1 per share, or $100,000, payable August 20th to stockholders of record of July 31st.

Colorado Coal and Iron Company of Colorado. Coupon No. 19, due August 1, 1889, on the bonds of this company, will be paid on and after that date at the office of the company, 15 Broad street, New York.

Sloss Iron and Steel Company, of Alabama, coupons due August 1st, payable Central Trust Company, New York.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Alpha Cons. Mill. & Mg., Nev.	3	July 15	Aug. 22	Sept. 12	.25
Alpha Cons. Mg., Nev.	25	July 15	Aug. 22	Sept. 12	.87½
Anchor, Utah	11	June 18	July 20	Aug. 5	.20
Andes, Nev.	35	June 12	July 18	Aug. 8	.25
Baker Divide, Cal.	17	July 8	Aug. 10	Aug. 28	.25
Baltimore, Nev.	5	July 2	Aug. 5	Aug. 24	.25
Best & Belcher, Nev	43	June 6	July 11	Aug. 1	.25
Castle Chief, Dak.	1	July 3	Aug. 6	Aug. 26	.10
Chollar, Nev.	27	July 15	Aug. 20	Sept. 10	.50
Crown Point, Nev.	51	July 9	Aug. 12	Sept. 2	.50
Crocker, Ariz.	7	June 14	July 19	Aug. 13	.10
East Jackson, Mich.	....	July —	July 6	Aug. 1	.25
East Mount Diablo, Nev.	5	July 18	Aug. 22	Sept. 12	.10
Eureka Cons., Nev.	12	June 12	July 15	Aug. 7	.50
Golden Fleece, Cal.	14	May 21	July 20	Sept. 16	$17.00
Goodman, Nev.	6	June 15	July 20	Aug. 24	.05
Iron Hill, Dak.	16	July 2	Aug. 5	Aug. 24	.03
Mexican, Nev.	38	July 9	Aug. 13	Sept. 3	.25
Nevada Queen, Nev	5	June 3	July 9	July 30	.50
North Belle Isle, Nev	15	June 27	Aug. 1	Aug. 22	.30
Original, Nev.	12	June 12	July 25	Aug. 14	.25
Platt & Gilson, Cal.	1	June 20	July 22	Aug. 7	$3.00
Quartz Mt., Cal.	21	June 17	July 22	Aug. 15	.40
Savage, Nev.	73	July 19	Aug. 21	Sept. 10	.50
Seg. Belcher, Nev.	95	June 4	July 8	July 29	.25
Sierra Nevada, Nev.	38	June 7	July 11	July 31	.25
Utah Cons., Nev.	7	July 9	Aug. 13	Aug. 30	.25

MINING STOCKS.

For quotations see pages 87 and 88.

New York.

FRIDAY EVENING, July 26.

There is just a trifle better tone in this market, but prices remain unchanged. The committee on Mining Securities advise us that they continue to investigate those companies that have failed to give quotations for quite a time and the reports that have reached them so far are said to be favorable to the companies.

Silver King continues to be boomed by its manipulators, and the price this week advanced from 79c. to $1.

There is no change to note in United Copper, which is selling at from $1.05 to $1.10.

Sutro Tunnel stock has disappeared from the list. The trust certificates were quite active, selling at from 50 to 58c.

Consolidated California & Virginia was firm at from $7.13 to $7.25. Yellow Jacket declined from $3.10 to $2.90. Sierra Nevada from $2.50 to $2.35. Savage was firm at from $1.75 to $1.80. Ophir advanced from $4.75 to $5. Hale & Norcross sold at from $3.10 to $3.15. Gould & Curry at from $2 to $2.15. Crown Point at $2.25 to $2.30. Chollar declined from $1.60 to $1.45. Belcher was firm at $3.10. Utah at 90c. Union Consolidated at $3. Scorpion advanced from 33 to 45c. Potosi from $1.60 to $1.75. Occidental declined from $2.40 to $1.90, but sold to-day again at $2.25. Mexican brought from $2.95 to $3.10. Julia, 30c. Exchequer, 70c. Bullion, 70 to 80c., and Best & Belcher, $3.60 to $3.65.

Very little is doing in Barcelona, and only one sale is reported this week at 20c.

The Tuscarora stocks remain firm. Navajo selling at from 40 to 50c. North Belle Isle, from $1.10 to $1.35, and Belle Isle at 25c.

Commonwealth shows one transaction at $4.25.

The centre of attraction this week was Ward Consolidated, which was listed last week at $1.10. The price opened on Saturday at $1.30, and has since steadily advanced, reaching $1.75 to-day. Some 9,600 shares changed hands during the week. Plutus was quiet, selling at from 79c. to 82c. Little Chief was neglected, and shows only one sale at 35c. The same may be said of Iron Silver, the price of which is quoted at $2; Dunkin at 95c.; Colorado Central at $1.50; Aspen at $9.25, and Silver Cord at 60c.

There was a downward movement in El Cristo, which went from $1,25 to $1.10.

No sales were made in Horn Silver until to-day, when the price was quoted at $1.05 and $1, Ontario shows one transaction at $35.25.

The only sales in the Black Hill stocks were Deadwood-Terra to-day at $1.55, and Iron Hill at 50c.

Mutual was firm at from $1.40 to $1.50.

San Sebastian was dealt in to-day at 30c.

No interest is shown in the Bodie stocks; Standard shows only one sale at 90c.; Bodie a few at $1.20@$1.25; Bulwer declined from 36 to 30c., and Mono from $1.00 to 85c.

Plymouth Consolidated is attracting no attention; two sales were made, one at $6.75, and one at $7.25.

Brunswick for the first time in several weeks showed a sale, bringing 6c. per share.

Quicksilver Preferred is up to $37.

The old Tortillita bubble of Arizona has finally collapsed so far as the stockholders are concerned. The ENGINEERING AND MINING JOURNAL had all along warned them of its nature while telling them that the mine contained a little rich ore.

It appears from advices we have received that Mr. D. T. Elmore, the former superintendent for this company, quietly put in his claim for salary and sold out the whole thing at Sheriff's sale and bought it in himself. Since then he took out a good deal of silver and has made enough money out of it to buy another mine. The risks of mining have in this case been increased by the risks of management. The stockholders are nowhere.

Rappahannock sold at 6@7c.

Boston.

July 25.

[From our Special Correspondent.]

There is absolutely no feature to the market. The orders to buy or sell are few and far between, and a summer dullness seems to have settled upon us. The few stocks sold have been marketed at about the same prices as last week, and transactions have been mainly in Calumet & Hecla and Boston & Montana, the former selling at $207@$208 and the latter at $35¼@$36. A dividend of $1 per share is announced on Boston & Montana. Franklin sold at $9. Osceola at $8½, and Kearsage at $5. Santa Fe dropped to 50c. on sales of 3,000 shares. The balance of the list utterly neglected.

There is no change in the copper situation, and we cannot see any indication of an active market in copper stocks until the several companies agree upon some compromise or agreement in regard to the future output, and price of ingot. When this is settled upon some permanent basis then the public will buy the better class of stock for investment, and speculation in the non-dividend mines will be in order.

In silver stocks, Dunkin is about the only one showing activity. This is rather a favorite with Boston people, and its regular dividends gives it a market value at all times

July 26—By Telegraph.—Calumet and Hecla, $208 Boston and Montana, $35 bid.

Denver.

The new mining exchange at Denver was opened for business on the 22d inst. The Matchless and Allegheny, of Leadville; the Brownlow, of Park County, and the Mazeppa, of Gunnison County, were the first stocks listed, but many others have made application and are now being considered. The opening and closing quotations on mining stocks in New York, St. Louis and San Francisco will be received, and the Denver quotations will be sent to New York and St. Louis.

San Francisco.

July 26.

The following quotations were received by telegraph from San Francisco to-day: Alta, $1.30; Best & Belcher, $3.55; Belle Isle, 20c.; Bodie, $1.15; Bulwer, 30c.; Con. Cal. & Va., $7.80; Chollar, $1.40; Crown Point, $2.10; Commonwealth, $4.00; Eureka, $1.35; Gould & Curry, $2.00; Hale & Norcross, $3.00; Mexican, $2.95; Mono, 65c.; N. Belle Isle, $1.00; Nevada Queen, $1.25; Ophir, $4.60; Potosi, $1.55; Savage, $1.70; Sierra Nevada, $2.30; Union, $2.90; Utah, 75c.; Yellow Jacket, $2.85.

Trust Stocks.

Cable reports dated London, July 23, state that shares in the North American Salt Company were dealt in on that day at the Stock Exchange at 17s. 6d. premium.

Press reports state that the foreign electric welding patents were bought from Professor Thomson for $750,000 by the syndicate, who sold them to the Thomson European Electric Welding Company for $1,500,000. The stock, at 125, represents no cash in the company's treasury, simply the patents. The new addition of $100,000 is to be the working capital. The company will do no manufacturing, but sell rights to foreign countries.

Electric Stocks.

A special meeting of the stockholders of the Thomson European Electric Welding Company, to the organization of which we referred in our last issue, is called for the 29th inst., to vote upon an increase of capital stock to $1,600,000. This is an increase of $100,000.

PIPE LINE CERTIFICATES.

Special report by Messrs. WATSON & GIBSON.

Since our last advices oil has scored quite an advance, and the reasons for it we have ascribed to the fact that there has been quite a gradual concentration of actual certificates in the hands of few people; this, coupled with the additional fact that the consumption of Pennsylvania crude still exceeds the production nearly twenty-five thousand barrels a day has had an important bearing upon the advanced price. It has not required unlimited buying to do this, nor any great amount of vigorous bidding, but it has driven out considerable of the "short" interest, and has also brought a few additional buyers into the market. Another important fact regarding this product is that eighty per cent of the wells now drilling in Pennsylvania are in territory where the average wells produce but four to five barrels each, and that territory, or a good portion of it, is over twenty years old.

Well informed parties believe that the reports of the falling off of the Russian wells is well founded, and, as a consequence, that the American commodity must meet with much larger sales abroad. We do not favor trading in options, but we think that judicious purchases of actual certificates can be sold at still higher figures.

The following rules governing dealings in Pipe Line certificates were posted on the Consolidated Stock and Petroleum Exchange to-day:

The Pipe Line certificate balances, as shown by notices or clearing sheets, shall be contracted for with any member notified by the Clearing House for his account and risk.

The contract time on contract notices shall commence at ten A. M.; either party shall have the right to call for margins, which shall be responded to within thirty minutes.

The Clearing House Committee or manager shall post each day on the blackboard the clearing prices for each month, and cause the same to be sent over the tape at the close of business each day.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
July 20.....	94¼	94¾	95	94¾	113,000
22 ...	94¾	98¼	94¾	97⅞	910,000
23.....	98⅛	99¼	98⅜	99½	955,000
24.....	99½	102	99½	101⅛	948,000
25.....	101⅜	101⅝	100¾	100¾	440,000
26.....	101	101½	99⅞	100¼	422,000
Total sales in barrels.....					3,788,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
July 20.....	94	94	93⅞	94⅞	62,000
22.....	95¼	100	94⅞	98	1,033,000
23.....	98⅛	99¾	98⅛	99½	1,096,000
24.....	100	102½	99	101¼	2,089,000
25.....	101¼	101⅝	100¾	100¾	715,000
26.....	100½	101¾	99⅞	100¼	906,000
Total sales in barrels.....					5,901,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 26.

Statistics.

PRODUCTION OF ANTHRACITE COAL for week ended July 20th, and year from January 1st.

Tons of 2,240 lbs.	1889. Week.	1889. Year.	1888. Year.
P. & Read. R.R. Co.	189,439	3,402,310	3,053,023
Cent. R.R. of N. J.	125,060	3,024,343	2,757,643
L. V. R.R. Co.	237,761	4,016,984	3,277,939
D., L. & W. R.R. Co.	137,593	2,488,481	3,412,397
D. & H. Canal Co.	89,083	2,032,198	2,267,365
Penna. R.R.	72,705	1,787,119	2,368,737
Penna. Coal Co.	41,865	631,076	847,174
Penna. Canal Co.	9,000	191,862	210,174
N. Y., L. E. & W.	24,000	619,628	495,976
Total	926,506	18,194,001	18,690,428
Decrease		527,740	

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1884	15,768,170	1886	16,536,845
1885	15,432,469	1887	18,501,805

PRODUCTION OF COKE on line of Pennsylvania R. R. for week ending July 20th and year from January 1st, in tons of 2,000 lbs.: Week, 88,753 tons; year, 2,420,860 tons; to corresponding date in 1888, 2,132,926.

PRODUCTION OF BITUMINOUS COAL for week ended July 20th, and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

Tons of 2,240 lbs.	1889. Week.	1889. Year.	1888. Year.
Phila. & Erie R.R.	1,515	36,361	34,629
Cumberland, Md.	63,435	1,638,550	1,908,875
Barclay, Pa.	3,500	63,003	101,717
Broad Top, Pa.	2,500	165,334	196,490
Clearfield, Pa.	75,433	1,617,537	2,080,943
Allegheny, Pa.	8,574	418,329	487,288
Beach Creek, Pa.	37,561	765,185	953,145
Pocahontas Flat Top.	41,960	942,084	882,135
Kanawha, W. Va.	*34,374	940,617	944,029
Total	266,852	6,585,610	7,589,256

*Week ending July 14th.

WESTERN SHIPMENTS.

Pittsburg, Pa	15,907	320,101	442,249
Westmoreland, Pa	43,340	758,332	961, 55
Monongahela, Pa	9,789	172,334	231,118
Total	69,036	1,250,767	1,634,822
Grand total	335,888	7,836,377	9,224,078

Anthracite.

The demand for anthracite still lags, and new orders are not so abundant as the companies would like Nevertheless there need be no anxiety on this account, for the business to be done during the remainder of the year is bound to be large and will tax the companies to their utmost during September, October and November. We continue our prices as heretofore: Free burning coal, f.o.b., New York shipping ports: Broken coal, $3.90; egg and chestnut, $4.15, and stove, $4.40 per ton.

These figures are pretty freely cut by individual operators, and good coal can still be obtained at very reasonable prices.

Some time ago we referred to the rumor that an anthracite coal "trust" is being worked up. We had scarcely thought this device necessary where the companies had held so well together as they have during the past year on a simple "understanding between gentlemen." A few concerns control the entire anthracite coal production of this country, excepting the little Rhode Island field and some in the far West, and it is quite possible to maintain prices at fair figures, and even, perhaps, at somewhat too high figures without recourse to a "trust." We are confident that the organization of a trust will be mischievous and very injurious to the trade. We have already many times expressed our views upon this subject in these columns and return to the question in our editorial pages this week. While we have undoubted information as to the fact that such a trust is being worked up, we still hope that its consummation may be deferred or abandoned.

The Pennsylvania Railroad Company, it is said, has announced a reduction of 50 cents a ton on the rates for anthracite from the mines to Chicago, commencing July 19th. The new rate is $3.50 per ton in place of $4.

Bituminous.

There is nothing worthy of note to give in this article; prices remain pretty well up to the schedule and may be quoted $2.50@$2.60 at Baltimore, and in New York $3.25@$3.50 alongside. The demand from the East is steadily increasing and vessels are scarce, so that many of the consumers in that market will very probably have to pay more before the season closes than they have been accustomed to. All rail deliveries to New England are increasing so that the influence of vessel freights is diminishing.

Boston. July 25.

[From Our Special Correspondent.]

The scarcity of vessels and the advance in prices continues to make business poor in anthracite coal at this port. If shippers should really shut down on deliveries of coal ordered two and three months ago, some buying activity would be forced, but no such movement is anticipated. Vessels have been so scarce, comparatively speaking, that everybody, almost, is behind, and there is more coal due on old orders than usual at this season. There is now a very fair stock of anthracite, domestic sizes. Small steam sizes do not accumulate to any noticeable extent, as the recent scarcity of bituminous has improved the demand for pea and buckwheat. More of these small sizes is now accumulating, however, and rates are named a trifle more advantageous to the buyer than a fortnight ago. Circular rates on domestic sizes nominally prevail, but it is not at all difficult to get good coal at 15 to 25 cents off. Stocks in this vicinity are small, though about as much is ordered as is usual at this time of the year.

The demand for bituminous continues moderately active, so far as small lots are concerned. The backward tendency in the matter of shipments, which I have before noted, becomes more and more pronounced. Almost every large shipper is behind on deliveries, and some of them are seriously behind. Two causes exist for this state of affairs: the want of coal for a month in adequate supply at tidewater, owing to the floods which set in at the time of the Johnstown disaster, and the scarcity of vessels from the opening of the season. The first obstacle to seasonable deliveries is remedied; the second is not. There is now a fair supply of bituminous coal of all leading kinds at tidewater, but vessels are as scarce as ever. There is really some prospect of a pinch in steam coal three or four months later unless unusual means are taken to forward coal. More coal is coming into our New England points all rail than ever before, but there is still quite a gap between water freights and rail freights to most points. Of course those shippers who are not so unfortunate as to be caught on delivered-prices contracts would bid up freight if their customers would consent, but up to this time nearly every one has been holding off for the drop in freight which does not come, and which probably will not come this season. I expect to see this holding-off policy change in the immediate future, as it is getting late, and coal must be had even if freights do go up. As for prices of bituminous coal, there is no change to note. No big contracts are in the market, but small ones, say, of one and two cargoes are being sold in average amount for this time of the season and at as low f.o.b. prices as have prevailed at any time.

Freights continue strong, and many are beginning to abandon hopes of any decline which would be worth waiting for longer, while some claim that the lowest figures have been touched. New York freights range from 95c. to $1.10; Philadelphia, $1.10 to $1.25; Baltimore, $1.15 to $1.25; in all cases with strong tendency. I find a general expectation of lower rates next season, as there is more activity in our New England ship yards at present than for many years. Every yard of any consequence is busy. By the way, it is possible that some enterprising party may get hold of the iron tramp steamer Eduardo, which ran ashore near Machiasport, Me., Saturday night last in the fog. She is 1,246 tons registered and hails from Bilbao, and if got off would make a fine barge.

Retail trade is dull, and dealers are thinking of taking this occasion to mark up the goods. The advance which the combination expects to make right away will not be unwarranted, however, considering the outlook and the present rather low rates in Boston retail coal trade. The retail dealers are prospering generally and the trade was never in better shape than at present. The receipts for the week were 50,558 tons anthracite, 12,852 tons bituminous. Since January 1st receipts have been 684,794 tons anthracite and 476,138 tons bituminous; total, 1,160,932 tons.

Buffalo. July 25.

[From our Special Correspondent.]

The anthracite coal trade is moderately active for local consumption, and a few orders from outside parties keep the wheels of commerce from rusting. Prices unchanged and firm.

Soft coal is very firm, with an upward tendency in quotations. Dealers show by their actions that they feel real good, and their spirits are buoyant. There is quite a scarcity of bituminous fuel, and the talk is of want of transportation facilities from the mines. The demand is good for ordinary manufacturing and steam-boat requirements, and there are many orders from out of town parties. Deliveries are made to old customers in preference to new ones for the time being, or until stocks are larger.

Coke is without new conditions, and trade is up to average.

Work on the shipping trestles of the New York Central and the Reading railroads in this city is progressing rapidly, and will be completed by January 1st, 1890. With reference to the cribs and docks, they will have an 18-foot channel around them. The retail trestle and hoists for loading cars will be located on the main land.

The ore trade is quite brisk. Last Friday 47 vessels were waiting to be unloaded at Ashtabula, Lake Erie, and 13 more were expected the next day.

The Globe Iron Works, at Cleveland, are about to construct four steel propellers (duplicate vessels of the celebrated Northern Line) at a cost of $800,000; also two propellers for the Lehigh Valley Transportation Company, at $250,000 each. These boats are to be ready for launching within a year from date.

For several days there has been a brisk demand for vessels to take coal hence to Chicago and Toledo. Last Thur day afternoon an advance of 10c. was obtained for freight to the former and 5c. to the latter port. An effort was made to obtain an increased rate to Milwaukee, but it was unsuccessful. The strike at Duluth and other Lake Superior ports has, in a great measure, stopped inquiry for vessels to said ports. The news this morning is to the effect that "the strike is being slowly but surely crushed out."

Lake shipments of coal from this port from July 18th to 24th, both days inclusive, aggregated 59,540 net tons, namely: 27,330 to Chicago, 5,600 to Milwaukee, 5,900 to Duluth, 1,300 to Superior, 2,650 to Lake Linden, 4,110 to Toledo, 900 to Hancock, 1,800 to Marquette, 100 to Bay City, 2,400 to Gladstone, 750 to Houghton, 300 to Cheboygan, 600 to Oscoda, 600 to Sault Ste. Marie, 500 to Owen Sound, 2,000 to Saginaw, 600 to Green Bay and 1,650 to Detroit; total for the season to date, 807,770 net tons.

The rates of freight were 60c. to Chicago, Kenosha and Owen Sound; 50c. to Milwaukee, Sault Ste. Marie, Portage, Gladstone, Green Bay, Houghton, Hancock, Manitowoc and Lake Linden; 40c. to Duluth, Saginaw and Superior; 45c. to Marquette; 30c. to Toledo and Detroit; 55c. to Racine, and on private terms to Cheboygan and Oscoda.

Shipments of coal hence by canal for third week in July, 198 net tons; receipts, 3,808 net tons. One charter reported a load of coal to Palmyra 45c. per net ton, free on and off.

The damages to the canal aqueduct, etc., at Fort Plain, by heavy rain and floods caused navigation to be suspended for over two days.

Pittsburg. July 25.

[From our Special Correspondent.]

Coal.—The situation on the Monongahela has undergone quite a change. The miners in the 1st, 2d and 3d pools were demanding three cents for mining, which the owners refused to pay and closed their works. The 4th pool miners have been working right along at two cents. On Tuesday the idle miners sent a written notice to Joseph Walton & Co. offering to go to work at 2¼ cents, which was accepted The prospect is that other mines will start at that figure.

The nominal rates are:

PRICE OF COAL PER 100 BUSHELS = 7,600 LBS.

First pool	$4.75	Fourth pool	$3.25
Second pool	4.50	Railroad coal	5.00@6.00
Third pool	3.90		

Connellsville Coke.—The H. C. Frick Coke Company are now the largest coke operators in the world, with a daily capacity of over 10,000 tons per day, or 3,250,000 tons per year.

Trade continues to improve, and the prospect for an active fall trade is good. Iron is advancing, and coke will soon follow. Operations of the seventy-seven coke plants last week: 11,583 active ovens, 1,784 idle, and 620 being constructed, against 11,419 active, 1,942 idle the previous week. Estimated production, 118,542 tons, against 97,519 tons previous week. Shipments continue to show an increase.

Quotations as follows per ton:

Furnace coke	$1.05@$1.10	Crushed	$1.50
To dealers	1.10@ 1.15	Foundries	1.25

Freight rates from the ovens to Pittsburg, 70c. per ton; to Shenango Valley, $1.35; Cleveland, $2.80; East St. Louis, $3.50; Chicago, $2.75.

FREIGHTS.

Coal Rates in Nebraska.—At a meeting of the State Board of Transportation held at Lincoln, Neb., on the 25th inst., the report of the secretaries as to the proposed freight rates on coal was adopted, and the railway companies doing business in Nebraska were ordered to adopt these rates within thirty days.

Reduction of Freight Rates in Missouri.—JEFFERSON CITY, Mo., July 26.—The Railroad Commissioners met at Jefferson City, Mo., on the 25th inst. and agreed upon a reduction of general freight rates in the State. The reduction of coal rates is principally of local importance, and embraces a haul of fifty-five miles east of Kansas City. The cut is about 15 per cent.

Bullion and Ore Rates.—Chairman Walker, of the Inter-state Commerce Railway Association, has issued a new decision on the complicated question of rates on bullion and ore from Denver and Pueblo to Missouri River points. He makes a long explanation of the difficulties in arriving at a fair decision, and finally asserts that $8 a ton on bullion from Leadville to Denver is "not an unreasonable one in view of the value of the product, the distance involved, the recent advance in the market price of lead, the rates considered fair at other points, and the just claims of the carriers who are most interested in the traffic.

"The ore rate is a more uncertain element. There is nothing upon which the arbitrator can base a conclusion except the experience of traffic managers. Fortunately, however, in this there is no disagreement. All the lines concur in the belief that with a bullion rate of $8 the most satisfactory ore rate is $5. This is even concurred in by the line which not long since made a reduction in the ore rate, while it is the unanimous opinion that the late fluctuations have been demoralizing to the commercial interests involved, affording another illustration of the fact that unsteadiness of freight rates is injurious to the public and detrimental to business prosperity. The true course at the present time undoubtedly is to restore the rates to their former basis of $8 and $5, respectively.

"The restoration is awarded in the belief that it will promote the permanent welfare of the carriers and also of producers at other various points of shipment."

In brief this means simply that the railroads, as we prepared our readers to expect, take about all the advance that is expected from the curtailment in the import of Mexican ores as our special Leadville correspondent stated last week.

"The smelters loudly proclaim that they cannot stand another cent a unit more than they have been paying for the past few months, so the new contracts were let at the old schedule of forty, flat, and three fifty off for thirty and over.

"The high figures that have to be paid for lead carbonates prevent any advance in siliceous dry ore, and the old rates still prevail of 95 per cent of New York quotations for the silver, less $11 to $14 per ton working charge."

The miner gains nothing, the smelter gains nothing, but the railroads can advance their rates.

The following rates per ton of 2,240 lbs. for coal charters are reported:

From Baltimore to: Bangor, 1.25@1.30; Bath, Me., 1.25@1.30; Boston, Mass., 1.25; Bridgeport, 1.05; Brooklyn, 1.00; Charleston, .70@.75; Fall River, 1.15; Galveston, 3.25; Gardner, 1.40; Lynn, 1.25; New Bedford, 1.15; Newburyport, 1.40; New Haven, 1.15; New London, 1.10; New York, 1.05; Portland, 1.25; Portsmouth, N. H., 1.25@1.35; Providence, 1.15; Quincy Point, 1.15; Richmond, Va., .70; Salem, Mass., 1.30; Savannah, 1.10; Somerset, 1.15; Weymouth, 1.20; Williamsburg, N. Y., 1.05; Wilmington, N. C., 1.00.

From Philadelphia to: Annapolis, 70; Baltimore, .60†; Bangor, Me., 1.15*; Boston, 1.10@1.15*; Charleston, .75; Charlestown, 1.20*; Chelsea, 1.20*; East Cambridge, 1.15*; Fall River, .80@.90*; Gardner, Me., 1.15*; Georgetown, D. C., .85†; Gloucester, 1.20†; Lynn, 1.37½*; Milton, 1.25*; New Bedford, .80@.90*; Newburyport, 1.30*; New York, .90†; Norfolk, Va., .65; Portland, 1.15*; Portsmouth, N. H., 1.15*; Providence, .80@.90*; Richmond, Va., .60; Salem, 1.15@1.25*; Savannah, 1.15*; Washington, .85.†

From New York to: Boston, Mass., 1.00*; Bridgeport, Conn., .65*; Fall River, .75*; Norwich, .70*; Portland, 1.00*; Portsmouth, N. H., 1.10*; Quincy Point, 1.00*; Saco, 1.00*; Salem, Mass., 1.00*; Saugus, 1.00.*

* And discharging. † Alongside.

METAL MARKET.

NEW YORK, Friday Evening, July 26, 1889.
Prices of silver per ounce troy.

July	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	July	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
20	4.87¼	42⅛	92	24	4.87¼	*	92⅜
22	4.87¼	42 3-16	92⅛	25	4.87	42 5-16	92¼
23	4.87¼	42¼	*	26	4.87	42 3-16	91⅞

* 92 ⅛ to 92¼. * 42 5-16 to 42⅜

The silver market during first of the week advanced in London until it sold at 42⅜d. upon special orders. This was followed by a decline, which, together with a fall in exchange, closes silver somewhat lower than last week.

Council Bills advanced ⅛d.

Shipments of bullion to London have been large this week.

United States Assay Office at New York reports total receipts of silver for the week 100,000 ounces.

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting made no change in its minimum rate for discount, which remains at 2½ per cent. During the week the bank lost £183,000 sterling bullion, and the proportion of its reserve to its liabilities was reduced from 38·03 to 37·78 per cent, against an advance from 39·31 to 39 71 per cent in the same week last year, when its rate of discount was 2½ per cent. On the 25th inst. the bank lost £97,000 on balance. The weekly statement of the Bank of France shows a gain of 14,775,000 francs gold and a gain of 2,125,000 francs silver.

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked.
Trade dollars	$ .72	$ —
Mexican dollars	.73¼	.74
Peruvian soles and Chilian pesos	.73	.73½
English silver	4.86	4.90
Five francs	.94	.95
Victoria sovereigns	4.87	4.90
Twenty francs	3.92	3.95
Twenty marks	4.75	4.80
Spanish doubloons	15.55	15.75
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.65
Ten guilders	3.96	4.00

Copper.—In the home market another week of inactivity and dullness has to be reported. Quotations for Lake copper have been nominally upheld at about 12c. per pound, and consumers are generally paying that figure for the quantities they are obliged to buy, but it is also generally admitted that in spite of the compact of the producing companies to retain the 12c. level it is not impossible to secure some Lake copper under the price named.

The disposition on the part of consumers is still to buy as little as they possibly can and to employ the cheaper brands of casting copper whenever that is practicable. Casting copper is now obtainable at about 10⅝@10¾c. The reports from Europe, both by mail and cable, are of a more encouraging nature, and business on the other side continues very active, the consumptive demand for all kinds of copper and copper material being unusually heavy. During the past week the London market for Chili Bars and G. M. B.'s has been stronger and prices have advanced about £1 per ton, the last quotations received by cable being £41 15s. to £41 17s. 1d. spot, and £40 10s. to £40 15s. three months' futures. Tough copper is quoted £46 to £46 10s. Best selected, £47 to £48, and strong sheets, £53 to £54.

The exports of copper from New York during the past week were as follows:

		Copper.	Lbs.	
To Liverpool—				
By S. S. Italy		5 casks.	6,250	$650
To Liverpool—		Copper Matte.		
By S. S. Italy		210 bbls.	224,814	10,000
By S. S. Italy		5,602 sacks.	570,400	31,625
To Hamburg—				
By S. S. Moravia		696 bags.	76,800	4,221
" "	In transit from Mexico—	662 pieces of cop. lbs.	92,815	10,191
		54 sacks cop. mat.	6,409	

Tin.—The tin market has been somewhat erratic during the past week, and especially so in London, an unusual feature in that market being that "futures" have been quoted under the price of the spot metal. This is a condition that has not existed since the time when prices were at a much higher, and therefore unsafer, level than at present.

The cause of this appears to be that an English operator who is understood to be largely interested in tin has been trying to manipulate an advance in values without buying futures as well as spot offerings, and consequently the value of futures is comparatively lower. The operator referred to, is not thought to be strong enough financially to carry out his schemes successfully, and to-day's prices show a decline of about 12s. 6d. per ton, which led to the loss of the total gain for the week in this market. At the close of last week London quotations were £88 7s. 6d. spot and £88 15s. 3 months, and during the present week prices went up to £90 to £90 2s. 6d. spot, and £89 15s. to £89 17s. 6d. 3 months, the highest figures having been touched on Thursday, with a corresponding rise to 19 90 in our market. To-day London closes at £89 7s. 6d. spot and £89 2s. 6d. 3 months, and our closing quotations are: Spot, 19·70; August, 19·70; September, 19·75.

Lead.—The lead market has been dull during the whole of the week, and buyers are not numerous. Offerings, however continue comparatively light. Our closing quotations to-day are as follows: Domestic, common, spot and July, 3·80; August, 3·80; September, 3·85; Foreign, 4⅜.

In London the latest prices are: English lead, £12 12s. 6d.; Spanish, £12 7s. 6d.

The St. Louis Market.—Messrs. John Wahl & Co. telegraph us to-day as follows: Our market is quite firm and there is an improved feeling as to the immediate future of this metal. The dealings have not been large, but prices are stronger and the demand is better. Some 750 tons were sold at $3.75 during the past few days.

The Chicago Market.—Messrs. Everett & Post telegraph us to-day as follows: Early in the week our market was quiet, with buyers apathetic. Holders, however, were firm at and around 3·80c. Later the market was more active, with considerable inquiries noticeable. Sales for the week are over 400 tons, mostly for future delivery. Market closes steady at 3·80c.

Spelter.—The market for this metal has shown a considerable amount of strength during the week, and in addition to fair demand on the part of consumers there has also been a good deal of speculative buying The result of this has been an advance in prices, and we have now to quote 5⅛c. to 5·20c. for prime Western. Foreign is quoted 6c. to 6⅛c. here, and from £19 5s. to £19 10s. in London. American sheet zinc is 6¼c.

Antimony.—The firm tone reported for some time past is still maintained, and prices show no signs of weakening. Demand also continues satisfactory. We quote: Hallett's at 15¼@15½s., and Cookson's at 16¼@16½s.

Nickel.—Unchanged at 65@70c. a pound.

Quicksilver.—London Cables report Rothschild's price as £9 10s., with a prospect of a further advance, owing to the reduced production of the mines. Second hands quote at £9 8s. Here the wholesale price is $50 per flask, with the jobbing price 68 cents to 70 cents a pound.

Messrs. Markwald & Co., of London, send us the following special report, under date of July 13th, 1889:

The import season for quicksilver into the United Kingdom for 1889 being practically over, we can now place the actual figures before you:

Our import from the Almaden mines in Spain amounted to about	49,300	bottles.
From other mines in Spain, about	500	"
" Italian mines, about	5,700	"
" Austrian mines, about	1,300	"
	56,800	"
And our exports and home consumption during the same period, about	42,000	"
Leaving a surplus of	14,800	"

which, together with the stock left over on December 1st, 1888, form our entire visible supply for the world until January, 1890, the beginning of the new season. What that stock on December 1st, 1888, was is most difficult to state accurately, because Messrs. Rothschild & Sons, who alone are in a position to know their own stock, do not publish any statistics. The estimates in the trade regarding this stock vary a great deal; some make it out as low as 25,000 bottles, others as much as 40,000; probably a figure between the two may prove near the mark.

Compared with last year, when our imports from the Almaden mines were about 53,300 bottles, the reduction in the output is 4,000 bottles this year. Also Italy and Austria have sent considerably less so far this year, but their producing season not being over yet, some surplus of these mines, if there is any, may still be shipped to London. But what may be of the greatest importance to the future of the quicksilver trade is the decision of the Spanish government, by the strong advices of their engineers and for geological reasons, to reduce their entire output for the coming season to net 40,000 bottles.

With these prospects before us, and the very important feature of the continued decreasing production of the new Almaden and other Californian mines, we can only repeat over and over again what we have asserted when the price of quicksilver was much lower than it now is, that this article will command in future a price quite different from its present one, but probably prices which are in our memory from the years 1873, 1874, 1875, namely, between £10 and £20.

Our market during June ruled quiet, this month being always the quietest of the year, but nevertheless prices did not decline, for apart from the firmness at Messrs. Rothschild & Sons', all the second-hand stuff is held most firmly. We quote £9 5s. in first hands; £9 in second hands.

An auction sale of thirty and more delinquent membership certificates of the New York Metal Exchange took place on the 25th inst. The prices ranged from $43 to $53, only one seat reaching the higher figures. By the last annual report the invested property of the Exchange amounted to $55,538.52, with a membership of 336, making the average to each certificate holder $165.30. It is said that while there are but few sales at the Exchange, it is kept open at an expense of $11,000 a year.

IRON MARKET REVIEW.

FRIDAY EVENING, July 26.

The condition of the iron market all over the country commences to show an improved demand, and the statistics of production and stocks of pig iron, which are published on another page, demonstrate that even while the markets were extremely dull, consumption was going on at a larger rate than ever before. These features are important as showing that a purely normal consumption is absorbing iron at the rate of about 8,000,000 tons (of 2,000 pounds each) yearly, and anything like a "boom" might easily bring the demand fully up to the capacity of our modern or economical furnaces.

The outlook in the pig iron business is therefore very satisfactory, provided prices be maintained low to encourage consumption, and that the business be not blighted by combinations or trusts.

Prices obtained are certainly higher than they were a few weeks ago, and the tone of the market in nearly every article is firmer, and buyers have in many cases to look around a good deal before finding what they want. There is no cause for any rush, but prudent buyers will not go much astray in buying their supplies for several months ahead.

The enormous output of iron ores from Lake Superior show that there will be an abundance of the raw material, while recent finds nearer tide-water, if fully substantiated, foreshadow a great change in the condition of the Eastern iron production, and will tend to control prices at a low level. There is, therefore, no prospect of any great advance, nor is any needed, for the furnaces at present supplying the market are, as a rule, making satisfactory profits.

American Pig.—The demand here is fair to middling, in some brands active, and prices unchanged, though an improving feeling is manifest, due, no doubt to the reports from other markets which are all more active than this one. Our quotations remain at $17.00@$18.00 for No 1 Foundry; $16.00 @$17.00 for No. 2, and $15.00@$15.50 for Gray Forge. Southern brands are held at $16.50@$17 50 for No. 1, $15.50@$16.50 for No. 2, and $14.75@ $15.00 for Gray Forge.

It will not be surprising if some of these quotations will have to be advanced 25 cents within a week or two.

Scotch Pig.—The price has again advanced abroad, and the market there is reported as strong. Freights from Glasgow, about 5s. The following are latest cable quotations: Scotch Warrants, 44s. 11d.; Coltness, 57s.; Langloan, 56s.; Summerlee, 55s. 6d.; Gartsherrie, 55s.; all at Glasgow; and Glengarnock, 53s. 9d.; Dalmellington, 47s.; Eglinton, 46s., all at Ardrossan.

The following are present prices, though somewhat more is asked in some cases. These prices leave no profit on importation. Dalmellington, $19.75; Eglinton, $19.25; Langloan, $21.25; Summerlee, $21.75; Shotts, $21.25; Coltness, $21.75.

Spiegeleisen.—The demand is still sluggish and prices nominally unchanged at $28 to $28.50 for 20 per cent and $59@$60 for 80 per cent ferro. In reality there seems to be a rather firmer tone in the market, which probably indicates rather freer buying.

Billets, Slabs and Rods.—There is no quotable change in this market. Foreign wire rods are quoted at $43 and American steel nail slabs at $29.50. The better feeling in the Western nail markets may bring a little much needed life into this article here.

Steel Rails.—The demand for rails is still dull, but the certainty of good crops in nearly every part of the country is beginning to inspire confidence in railroad matters, and this will lead to much greater activity in road building and increase the demand for rails and rolling stock. $28 is now obtained at Eastern mills, where figures are better maintained than in the West.

Steel Plates are held as follows on wharf: Tank and Ship, 2·25; Shell, 2·4@2·5; Flange, 2·8; Fire-Box, 3·50@4 Business is fair for the season. Indeed, it shows a tendency on the part of buyers to anticipate wants.

Iron Plates are quoted as follows on wharf: Common tank, 2·25c.; refined, 2·3@2·4c.; shell, 2·4 @2·5c.; flange, 3·5@3·7c.; extra flange, 3¾@4.

Bar Iron.—At mill common is quoted at 1·6@1·7c., and refined at 1·75@1·9c. Deliveries from store are quoted as follows: Common, 1·9c. base; Refined, 2c. base; "Ulster," 3c. base; "Norway," 5c. shapes, and Norway nail rods, 5c

Merchant Steel.—The volume of business done is satisfactory. Prices nominally are unchanged, though lots of tool steel are still sold as low as 7c., and in a retail way at 7½c. to 8½c. Best English tool steel, 15c. net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c., Bessemer machinery, 2¼@2½c.; Bessemer spring, 2¼@2½c. Open hearth standard grades and spring steel range from 2½ to 3c. Tire steel at 2½c.

Structural Iron and Steel.—The activity in structural iron and steel continues, though prices remain a little unsteady, with an upward tendency. The most active season for building has commenced, and contractors who had postponed orders with the hopes of getting lower prices, are now covering at higher figures than ruled a month or so ago. We quote as follows, at mill: Bridge plate, 2·1c.; angles, 2@2·1c.; Tees, 2·5@2·6c.; steel angles, 2·5c.; beams and channels, on wharf, 2·8c.

Pipes and Tubes.—Last week we quoted the new scale of discounts adopted by the Wrought-Iron Pipe and Tube Manufacturers' Association, as follows: On butt-welded pipe, 50 per cent; lap-welded pipe, 62½ per cent; butt-welded pipe (galvanized), 41⅔ per cent; lap-welded pipe (galvanized), 50 per cent; casings, 5⅝ inches, 60 per cent; all other sizes, 57½ per cent; boiler tubes, 1¾ inches and smaller, 52½ per cent; boiler tubes, 2 inches and larger, 57½ per cent; 2½-inch line pipe, per foot, net, 17c.; 3-inch, 22c.; 3½-inch, 27c.; 4-inch, 32c.; 5-inch, 46c.; 6-inch, 62c.; 7-inch, 76c.; 8-inch, $1.04; 9-inch, $1.30; 10-inch, $1.35; 11-inch, $1.75.

Cast Iron pipe remains at $25.50@$30, according to size.

Rail Fastenings.—The following are ruling prices, unchanged from those last quoted: Spikes, 1·95c.; angle fish-bars, 1·75@1·85c.; bolts and sq. nuts, .70@2·75c.; bolts and hex. nuts, 2·80@3c.

Old Material.—Old rails are in light supply. We quote $22.75@$23 per ton for Tees, No. 1; wrought scrap is held at $21, cast scrap $15.50, and old car wheels $18.

The Difference between Steel Strips and Hoop Steel.—Important Customs Decision.

The Treasury Department has refused to modify a decision made on the 18th ultimo, affirming the decision of the Collector of Customs at New York in assessing duty at the rate of 45 per cent *ad valorem* on certain imported steel strips, or hoop steel. The importers, in asking for a reconsideration of the decision, claim that the statement of the appraiser that the steel in question is made from wire or wire rods rolled flat is incorrect, and that it is in fact rolled direct from the billet in the same way as any other flat strips or hoops. The appraiser states that while the steel has the appearance, by its rounded edges, of having been rolled from wire rods, it may have been produced from billets rolled in grooved rollers. He renews, however, his statement that the steel is not the steel strips of commerce. As this is the vital question in the case, the department sees no good reason for reversing or modifying its former decision.

Duty on Steel-Plate Shearings.

Acting Secretary Batcheller has sustained an appeal from the decision of the Collector of Customs at Philadelphia in regard to the classification of certain steel-plate shearings, consisting of new pieces of steel cut from boiler-plates in the process of manufacturing boiler-plates at the rolling-mills. The collector assessed duty at the rate of 3-10ths of 1 cent per pound, whereas the department decides that they are dutiable at the rate of 45 per cent ad valorem.

Philadelphia. July 25.

(From our Special Correspondent.)

The advance which was threatened ten days ago has arrived in force, and all branches of the iron trade feel the benefit. People who waited until bottom was reached now regret their long delay; careful inquiry on both sides of the market, buying and selling, fails to justify some accounts sent out regarding the volume of business. The market can only be described generally. There is a large and steady volume of business, but buyers are not crowding over each other. Larger contracts for iron are being placed than immediate requirements call for. Late fall and early winter requirements will not be generally covered for some little time. Some doubt exists as to the permanency of the present strength of the market.

Pig Iron.—The better demand for finished iron, noticed particularly since Monday, has induced a good many who had been waiting to hurry in their orders. One 500-ton lot went to-day at $15.50, although some few brands bring more. If buyers want $15 iron they can readily find it, although in the aggregate there is less forge iron offering. The strong position among Southern makers and the heavy consumption in Western mills, help to strengthen the situation East. No 2 is still selling at $16@$16.50, and No. 1 at $17@$18, with nothing calling for special comment. The little increase in production will not affect prices. The offerings of Southern irons are infrequent, and they have ceased for the present to be an important factor

Blooms.—So far as quotations go to show, there is no change in the situation. No heavy transactions have occured, but there are inquiries to-day for a great deal of steel material and ordinary blooms as well. Tank slabs have been taken at $30@$30.50. Nail slabs are not doing much, but are held at $28.50. The quotations on scrap are $32; anthracite, $42, and charcoal, $52.

Muck Bars.—Some four thousand tons have been reported as sold within a week, but these figures do not represent all the transactions. One or two buyers claim to have escaped on $28, delivered, but the usual asking price is $28.50.

Merchant Bars.—There is very much talk about higher prices, and in some cases it is true; but there are still manufacturers unwilling to let a large cash order pass to a neighbor simply on a half tenth. Bar iron is selling here at 1·90, but the average is 1·80 to 1·85 at mill. Stores are claiming 1·95@2c., and no doubt are getting it. The large buyers are in, and yesterday and to-day mill owners have booked some of the best orders of the season. There is, as usual, some wild talk of another advance, but it is not likely to occur.

Nails.—The makers of first-class nails have been energetically pushing sales, and have succeeded in unloading large supplies at quite good prices. Stores quote to-day 2@2·10; factories, 1·88@1·90, though shadings are still heard of.

Skelp.—Some heavy transactions in skelp were closed late last and early this week at 1·75 to 1·80 for grooved. Sheared sold at 2c., and one or two parties are asking 2·10 to-day.

Wrought-Iron Pipe.—Discounts are now 50 per cent off for butt welded black, 62½ for lap welded, 42½ for butt welded galvanized, and 50 for lap welded, boiler tubes 50-57½ per cent off. Business is excellent.

Sheet Iron.—Last week's statement might safely be repeated, with stronger emphasis. Every buyer wants to load up, and the mills are booming on full or pretty nearly full card rates.

Plate Iron.—The plate mills are having a harvest of business, and capacity is being crowded to its utmost. Old orders are being hurried out of the way to make room for new ones that are marching to the front with banners flying. Notwithstanding this exceptional condition of business, such is the capacity and anxiety of companies for business that good orders are now and then shaded when good judges think there is no occasion to cut. Plate and tank is quoted and selling at 2·10@2·15; universal plates, 2·15@2·25; and shell, 2·40@2·50; flange, 3·25.

Structural Iron.—The accumulation of business has been of such proportions that two or three brokers have found customers willing to pay a tenth more for what they regard as accommodations. The average quotations are: Bridge plate, 2·10; angles, 2·10@2·20; tees, 2·60@2·70; beams and channels, 2·80. Orders are abundant and prospects could not be better.

Steel Rails.—Nearly all arriving orders are for small lots. Negotiations for large lots seem to have stopped on the way to rest. Business could be done at $28, but this is regarded as a rock bottom figure on ordinary business. At $28.50 business is being done almost daily. Light rails are selling well.

Old Rails.—There is scarcely anything to report. Parties are holding lots at $22.50@$23.

Scrap.—Holders are trying to get $21.50 for car lots, but lose sales in the effort. Choice is able to stay at $22, as the supply is limited.

Pittsburg. July 25.

[From our Special Correspondent.]

Raw Iron.—The market has been firm, with a fair demand for standard descriptions. The sales reported show plainly that stocks in the hands of consumers are light, that mills cannot be kept going without raw material. There is an under current, which gives indications of renewed activity, and a decidedly better feeling, based upon more extensive inquiries, which will undoubtedly result in liberal orders at an early date. Certain descriptions of iron sold at an advance over last week's prices, and offers were made for round lots of Bessemer and Grey Forge, which holders refused to accept, preferring to wait and take the chances for higher prices. Consumption is steadily increasing. Prices in the East are away above rates demanded here, so that consumers will generally have to rely on home product and from furnaces adjacent to Pittsburg, whence occasional supplies are drawn. A furnace man remarked, "we have several thousand tons piled up which can be had, but not at present prices; the fact is, we are not hunting purchasers, and believe there is money in waiting." Another remarked, "We are only selling limited amounts to our regular dealers, hence there is no pressure to sell. At the same time there is more disposition to buy, while indications point to greater activity in the near future, and a heavier volume of business."

Pittsburg furnaces have little to fear in the way of competition from the East, West or South. Skelp iron has materially advanced with liberal inquiries. Sheared, last week, $1.92½; this week, $2.05. Muck Bar is firm. Slabs and billets are much fancied. Old iron rails are scarce and higher. Gray Forge and Bessemer pig have an increased number of admirers. Scrap material is held firmly.

Prices.

Coke or Bituminous Pig—		Muck-Bar.....	27.00@27.50
Foundry No. 1..	$16.25@16.50	Steel Blooms..	.....@28.00
Foundry No. 2..	15.25@15.50	Steel Slabs.....	.....@28.50
Gray F. No. 3..	14.25@14.50	Steel Cr'p Ends	18.00@18.25
" No. 4..	13.75@14.00	Steel Bl. Ends..	18.25
White.....	13.50@.....	Ferro-Man., 80%	60.00@60.50
Mottled.....	13.50@.....	Steel Billets....	28.00@28.50
Silvery.....	16.00@18.50	Old Iron Rails..	23.25@23.50
Bessemer	16.25@16.50	Old Steel Rails.	17.50@18.00
Low Phos.....	20.50@21.00	No. 1 W. Scrap.	19.00@19.50
Charcoal Pig—		No. 2 W. Scrap.	17.50@18.00
Foundry No. 1..	23.50@24.50	Steel Rails.	27.50@28.50
Foundry No. 2..	22.00@22.25	" light sec..	27.50@31.50
Cold-Blast.....	25.00@28.00	Bar Iron, nom..	1.65@ 1.70
Warm-Blast....	24.00@25.00	Iron Nails.....	1.85@ 1.90
10 @ 12% Speigel	28.75@29.00	Steel Nails.....	1.85@ 1.90
20% Speigel.....	31.00	Wire Nails.....	2.15@ 2.20

Sales.

Coal and Coke Smelted Lake Ore.

4,000 Tons	Bessemer	$ 6.65 cash.
2,500 Tons	Bessemer	16.50 cash.
2,000 Tons	Gray Forge	14.25 cash.
1,500 Tons	Gray Forge	14.15 cash.
1,000 Tons	Gray Forge	14.25 cash.
3,000 Tons	Bessemer	16.25 cash.
1,000 Tons	Bessemer	16.00 cash.
1,200 Tons	Gray Forge	14.25 cash.
1,000 Tons	Gray Forge	14.15 cash.
2,000 Tons	Bessemer	16.50 cash.
100 Tons	No. 2 Foundry	15.50 4 mo.
100 Tons	No. 1 Foundry	16.00 cash.
125 Tons	No. 1 Foundry	16.25 cash.
100 Tons	No. 2 Foundry	15.25 cash.

Coke, Native Ore.

500 Tons	Gray Forge	14.15 cash.
300 Tons	Gray Forge	14.15 cash.
100 Tons	No. 1 Foundry	15.75 cash.
125 Tons	Silvery Foundry	16.00 4 mo.
60 Tons	Gray Forge	14.00 cash.
50 Tons	Mottled	13.50 cash.
1,000 Tons	Gray Forge	14.00 cash.

Charcoal.

300 Tons	No. 2 Foundry	21.00 cash.
50 Tons	Cold Blast	27.75 cash.

Muck Bar.

1,200 Tons	Neutral, July, August and Sept....	28.00 cash.
1,500 Tons	Neutral, July and August	27.50 cash.
1,000 Tons	Neutral, spot	27.00 cash.

Slabs and Billets.

2,000 Tons	Steel Billets	27.50 cash.
1,000 Tons	Nail Slabs	27.50 cash.

Steel Wire Rods.

500 Tons	American Fires	40.50 cash.
350 Tons	American Fires	40.00 cash.

Ferro-Manganese.

100 Tons	80 per cent	60.50 cash.
50 Tons	80 per cent	60.00 cash.

Skelp Iron.

750 Tons	Sheared, per 100 lbs	2.05 4 mo.
500 Tons	Narrow Grooved, per 100 lbs	1.67½ 4 mo.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, July 26.

Heavy Chemicals.—The improved tone in this market noted last week continues, and this condition is due to the belief that a considerable and permanent advance in price will take place, owing to the consolidation of the interests abroad in a permanent organization that will fix the prices and regulate the output of the different factories. According to the *Chemist and Druggist*, published in London: "Hitherto a maker has been free to decompose as much salt and turn out as much saltcake as he pleased, the only restriction imposed upon him being as to the sale of the finished products, bleaching powder, caustic soda, etc. Under the new rule, though nothing can yet be said with certainty, the idea probably is to assign to each maker a certain quantity of salt, based upon the estimated consumption of alkalies, which he may decompose."

The prices are firmly held on this side and we continue our quotations unchanged. For high test 70@74 per cent caustic soda, $2.20 is asked for spot and $2.22½ for small quantities. Some firms are holding their stocks at $2.25 as bottom. A fair business has been done at these figures. Caustic 60 per cent is quiet, and prices continue at $2.35@$2.40. We find the demand for bleaching powder is very good and the price is a little stronger, being $1.75 to $1.80. Soda ash continues quiet and prices are firmly held. There are rumors of some recent contracts being placed at from $1.25 to $1.27½ for the 48 per cent. Caustice soda ash is dull and prices are a little weak; any large orders could be placed at a trifle less than $1.25 which is the ruling quotation. There is no movement in sal soda and prices are 95c.@$1 for the English and 75@85c. for the American.

Acids.—The acid manufacturers, as indicated in our last issue, have met together and agreed among themselves to advance prices. For fifteen years there have been no fixed prices, and it is satisfactory to know that something definite has been at last agreed upon. There has been a fair jobbing demand for the mineral acids, and we give the advanced quotations: Sulphuric acid, 66°, $1@$1.75 per cwt.; nitric, $4.50@$7.50; muriatic, $1.25@$2, and acetic, $1.75@$2.25. Oxalic acid is in fair jobbing demand at unchanged quotations, and tartaric is quiet.

Fertilizers.—There have been no demands for goods in this market during the week, and with the exception of an advance in price of bone-black refuse we continue our former quotations.

Prices are as follows: Azotine, $2.30; dried blood (city), low grade, $2.30 per unit; Western high grade, $2.35@$2.37½ per unit for ground material; tankage, high grade, $24@$25 per ton; low grade, $22@23 per ton, as to quality. Fish scrap, $23 per ton, f.o.b. factory. Sulphate of ammonia at $3.05 @$3.10 per cwt.

Refuse bone-black, guaranteed 70 per cent phosphate, $19.50@$21 per ton. Dissolved bone-black is 90@95c. per unit for available phosphoric acid, and acid phosphate 80c. per unit for available phosphoric acid.

Steamed bones, unground, $20; ground, $24.

Charleston rock, undried, $5.50 per ton; kiln dried, $6.50@6.65 per ton, both f.o.b. vessels at the mines. Charleston rock, ground, $11, ex-steamer at New York.

Muriate of Potash is very dull, and the quotation is $1.80 per cwt. of 112 lbs. The arrivals, as fast as they come in, are absorbed by former contracts. We have to report the arrival of 200 tons by the steamer "Victoria Augusta."

Double manure salts, basis 48 per cent potash, is quiet at $1.15@$1.20 per cwt. High grade manure salt, basis 90 per cent potash, may be had on the spot at $2.30@$2.32½. The syndicate's price for futures is $2.50.

Kainit.—The situation is unchanged. Prices about the same, $9.75 for invoice weights and $10 actual weight, for cargo lots. The market is rather quiet.

Miscellaneous.—Nitrate of soda continues quiet, at unchanged quotations. There are no buyers, except for jobbing lots. Supplies on the spot are offered at $1.95 per cwt., and futures at $1.90.

Brimstone is quiet, at the advance noted in our last. On the spot $19.75 is asked for best unmixed seconds, and $19 for thirds. Seconds for future delivery are quoted at $19.50.

Blue Vitriol.—A jobbing demand prevails, but otherwise the market is quiet, at unchanged prices.

Copperas is higher, owing to the demand for disinfecting purposes in the South, and the exhaustion of stocks by the demands from the flooded districts. The quotation for car-load lots is 60c., and for small quantities 65@70c. is the ruling price.

NOTES OF THE WEEK.

The Pittsburg Salt Company has positively refused to sell out or enter into an agreement with the Salt Trust, known as the North American Salt Company, to which we referred in our last issue. The Pittsburg Salt Company is the largest firm opposed to the trust. It comprises Haller, Beck & Co., the Allegheny Salt Company, Limited, of Etna; Graham & Courtney, W. C. & J. M. Taylor and Haller & Beck. The firms also own considerable salt-producing territory in Ohio.

For the privilege of incorporation, the North American Salt Company had to pay a State tax of $13,750. This is the largest tax, with the exception of the Edison General Electric Company, which paid a tax of $15,000, that has been collected since the Vedder law went into existence.

Trade reports from Chicago announce that business in chemicals is brightening and that consumers are beginning to come into the market for supplies. They are finding firmer prices than they care to pay, especially in the soda ashes. In Boston business in the chemical line is active and fair prices are quoted.

Liverpool. July 10.

[Special report by Messrs. J. P. BRUNNER & Co.]

Chemicals.—Chlorate of potash has been the principal feature here lately, while the demand for caustic soda has fallen off, and prices are easier. Soda ash maintains its position, but transactions are on a limited scale. We quote: Caustic ash, 48 per cent, 1/16d. to 1 1/32d.; high test, 3/16d. to 1 1/32d. Carb. ash, 48 per cent, 3/32d. to 1 1/32d; high test, 3/32d. to 1 1/32d. Soda crystals in fair request, and held for £2 10s. to £2 12s. 6d. Caustic soda. There is less doing in this article, and, with resellers showing more anxiety to realize, values are a shade weaker. 60 per cent, we quote £5 12s. 6d.@£5 15s., and a sale reported for July-December at the higher figure; 70 per cent in limited demand and £6 12s. 6d.@£6 15s. are nominal values, while resale parcels could probably be had at a shade under the lower figure; 74 per cent, £7@£7 2s. 6d., and the lower figure paid; 76 per cent, £8@£8 5s.

Bleaching powder quiet, but there is very little offering, most makers holding off the market at present. £6 10s. is spot quotation, and some business has been done at this price, but there are not many orders in the market, the advance having checked business. Chlorate of potash.—There has been quite a run on this article lately, and an extensive business done at from 4¼@4½d. while sellers now decline to go on at under 4¾@5c. Bicarb. soda in good demand at £4 12s. 6d to £4 15s. per ton for one cwt kegs, according to brand and quantity, with usual allowances for larger packages. Sulphate of ammonia, quiet at £11 17s. 6d. to £12 per ton, for good gray 24 per cent f.o.b. Liverpool.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, July 26.

Bricks.—The demand is a little lighter than it has been running, and although the market can be said to be firm it is not active. We quote Haverstraw $5.75 @$6.25; Upriver, $5@$5.75; Hackensack, $5 25@ $5.75; Keyports and other Jerseys, $4.25@$5.25; Pale brick, $3.50@$3.75.

Lime.—There is no change to report, and we quote Rockland, $1@$1.20, common and finished, State lime 85@$1.10, St. John 90@95.

Cement.—This the dull season for cement, but prices are firm and everything points to a brisk business in a few weeks. We quote: Rosendale, 95c @ $1.10; Bridge brand, $1.10; Portland cement, $2.25@$2.50 for English, and $2.40@2.70 German.

CONTENTS.

	PAGE.
Howe's Metallurgy of Steel	67
New York World's Fair	67
The Anglo-American Salt Combination	67
English Investments in American Mines	67
Fashion in the Use of Disinfectants	67
Copper Production in Chili	67
Liability of Trust Certificate Holders	68
The Meaning of the Instructions for the Entry of Silver-Lead Ores	69
New Publications	68
Platinum	69
Mineral Waxes	69
Movable Leaching Trays	70
*Coal Screening and Washing at Commentry, France	70
Gold and Silver in the Ohio Valley	71
Sorel Stone	72
*Two Existing American Glaciers	72
Railroad Companies as Coal Miners and "Reasonable" Tolls	73
A Theory of Asphalto-Genesis	73
Production of Pig-Iron in the United States in 1889	74
Nova Scotia Marble	75
Preservation of Iron Stacks	75
An Acid Proof Paint	5
Government Statistics	75
Patents Granted	75
Howe's Metallurgy of Steel	(Supplement.)
Personals, Obituary, Industrial Notes	76
Contracting Notes	77
Machinery and Supplies Wanted at Home and Abroad	77

*Illustrated.

MINING NEWS:	
Arizona	77
California	77
Colorado	78
Dakota	78
Illinois	78
Kansas	78
Michigan	78
Minnesota	78
Montana	78
Nevada	79
New Mexico	79
Oregon	79
Pennsylvania	79
Utah	79
West Virginia	79
FOREIGN MINING NEWS:	
British Columbia	79
Canada	79
India	80
Mexico	80
MEETINGS	81
ASSESSMENTS	81
DIVIDENDS	81
MINING STOCK MARKETS:	
New York	81
Boston	81
Denver	81
San Francisco	81
Trust Stocks	81
Electric Stocks	81
Pipe Line Certificates	81
MINING STOCK TABLES:	
Baltimore	88
Birmingham	88
Boston	87
Coal Stocks	87
Kansas City	88
London	88
New York	87
Paris	88
Pittsburg	88
San Francisco	87
St. Louis	88
Auction Sale of Stocks	88
Electric Stocks	88
Trust Stocks	88
MARKETS:	
COAL: New York	81
Boston	82
Buffalo	82
Pittsburg	82
FREIGHTS	82
METALS	83
IRON: New York	83
Philadelphia	84
Pittsburg	84
IMPORTS AND EXPORTS OF METALS	85
CHEMICALS AND MINERALS	84
BUILDING MATERIALS	85
CURRENT PRICES:	
Chemicals	88
Minerals	88
Rarer Metals	88
Building Materials	88
Advertiser's Index	xxv

IMPORTS AND EXPORTS OF METALS AT NEW YORK JULY 13 TO JULY 20, 1889, AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co		86
Downing & Co., R.F		28
Hendricks Bros		28
Lamarche's Sons, H.		6
Naylor & Co	25	345
Total	25	593
Corres. date, 1888	69	1,242
Nickel.	Lbs.	Lbs.
McCoy & Sanders		11,240
Total		11,240
Corres. date, 1888		138,166
Antimony.	Casks.	Casks.
Total		1,358
Corres. date, 1888	225	1,786
Pig Lead.	Lbs.	Lbs.
Caswell, E. A		10
Erie Dispatch		9
Foley, E		43
Henderson Bros		11
Hendricks Bros		67
Total		140
Corres. date, 1888	111	257
Tin.	Tons.	Tons.
Amer. Metal Co	75	681
Bidwell & French	25	700
Bruce & Cook		14
Bursley, Ira	50	50
Carter, Hawley & Co		43
Cohn & Co., A		12
Crooks & Co	25	200
Daval & Son, John		21
Hendricks Bros	11	139
Knauth, N. & Kuhne		10
Lehmarer, S. & Co	10	107
Mendel & Tompkins		1
Muller, Schall & Co	18	935
Naumann, F		1
Naylor & Co	75	1,260
Phelps, Dodge & Co	115	1,950
Pope, J. E., Jr		225
Schmarer & Co		11
Thomsen, A. A		151
Thomsen, D	10	166
Townsend, J. R		135
Wheeler & Co		1
Total	414	6,877
Corres. date, 1888	383	8,265
Tin Plates.	Boxes.	Boxes.
American Metal Co		477
American Metre Co		433
Brown & Co., V. H		350
Bruce & Cook	1,410	54,703
Byrne & Co., J		8,392
Central Stamp. Co	1,301	59,137
Coddington & Co	2,097	96,349
Cohen, S. M		272
Cohn & Co., A	1,871	17,268
Con. Fruit Jar Co		981
Cort & Co., N. L	3,554	98,030
Corbier, F. & S	402	4,046
Crooks & Co	462	57,334
De Mitt & Co		11,121
Dickerson, V. D	3,188	226 354
Downing & Co		306
Erie Dispatch		244
Fenton, D. U	756	1,694
Foley, E		75
G. L. N		75
Holder & Herrick		271
Iron Clad M. Co		283
Ismay, J. B		500
Lalance & G		6,207
Lazard Bros		2,356
Lombard, Ayres		3,000
Merchant & Co	541	12,795
Mersick & Co		6,509
Morewood & Co		7,232
Mulholland & H		767
Newell Bros		294
Payne & Son		208
Phelps, Dodge & Co	21,138	383,460
Pratt Mfg. Co	3,279	139,648
Wolff & Reesing	1,817	4,923
Sanders Bros		479
Shepherd & Co	900	18,853
Somers Bros		1,356
Taylor Co., N. & G	240	576
Thomsen, A. A	3,174	122,138
Warren & Co., J. M		3,885
Wheeler & Co	602	14,209
Whittemore & Co	100	21,384
Wolff & Reesing	426	4,923
Total	47,558	1,472,492
Corres. date, 1888	27,706	1,118,067
Pig Iron.	Tons.	Tons.
Baldwin, A		100
Bartlett, N. S	100	1,100
Crocker Bros	200	4,800
Crooks & Co		500
Drummond, McC. & Co		1,500
Henderson Bros	150	316
Godwin & Son, A. G		390
Irvin & Co., R	50	200
Martin, W. T		150
Naylor & Co		50
Page, Newall & Co		75
Perry & Ryer		125
Pierson & Co		500
Pope, Sons & Co		250
Sheldon & Co., G. W		200
Stetson & Co		3,850
Topper & Beattie		100
Walbaum & Co		275
Whittemore & Co., H		50
Williamson & Co		2,400
Total	500	18,134
Corres. date, 1888	570	28,651
Steel Sheets, Billets, Forging, etc.	Tons.	Tons.
Abbott & Co		2,450
Ames, W. T		253
Austin & Co		30
Baldwin Bros. & Co		15
Belcher, H. W		95
Boker, C. F		131
Carey & Moen		118
Carter, G. F		200
Coddington & Co		24
Crenshaw, Hugh		27
Crooks & Co		292
Curtis, R. J		408
Curran, J		5
Dana & Co		12,020
Downing & Co		171
Erie Despatch		40
Galpin, S. H		497
Hugill, Chas		95
Ismay, J. B		174
Lalance, & G		106
Lazard Bros		6
Leng's Sons, J. S		114
Lublin & Estey		7
Lundberg, G		51
Mersick & Co		5
Milne & Co	148	2,144
Montgomery & Co		5
Naylor & Co		2,710
Newton & S		35
Oelrich & Co		389
Pierson & Co		323
Pilditch, F. S		75
Power, C. W		36
Prosser, Thos		496
Roebling's Sons		112
Schulze & R		13
Standard Oil Co		222
Stetson & Co		11
Strouse & Co., M		25
Temple & L		15
Wagner, W. F		373
Wallace & Co		5
Wetheral Bros		2
Whitney & W		30
Wiel Elie		44
Wiell & Co		7
Williams & W		95
Wolff, R. H		347
Total	148	25,458
Corres. date, 1888	294	17,281
Bar Iron.	Tons.	Tons.
Abbott & Co., J	55	1,072
Bacon & Co		330
Dana & Co		25
Downing & Co		519
Froment, F		10
Holt & Co., H. N	75	149
Jacobus, E. G		17
Lang & Co		3
Lilienberg, N		8
Lundberg, G		180
Lundell, C. G		160
Merchants' Dispatch		15
Milne & Co		1,337
Muller, Schall & Co		575
Naylor & Co		253
Ogden & W		7
Page, N. & Co	55	1,132
Plenty, John		2
Froment, F		440
Wells, F., & Co		15
Total	185	6,093
Corres. date, 1888	101	2,293
Steel and Iron Rods.	Tons.	Tons.
Abbott & Co., J	257	3,109
American S. Co		752
Bacon & Co		350
Baker, H	3	3
Belcher, H. W	3	3
Boker, H		20
Bruce & Cook		20
Carey & Moen	20	732
Cooper, H. & Co		40
Crabb & Co., W		17
Dana & Co		1,915
Downing & Co		690
Durbrow, Walter	100	472
Eckstein, G. C		98
Fuller, D. & T		15
Galpin, S. H		1,057
Hazard Mfg. Co		20
Heyn, A		2,034
Hugell, Chas		27
Lilienberg, N		56
Lundberg, G		520
Lundell, C. G		246
Milne & Co		979
Montgomery & Co		36
Muller, Schall & C		400
Naylor & Co	60	9,711
Nichols, B. J		10
Oelrichs & Co		50
Page, N. & Co		574
Pilditch, F. S		15
Plentz, J	1	1
Pratt Mfg. Co		30
Roebling's Son	151	1,316
Wagner, W. F		8
Wetherall Bros	2	2
Wheeler & Co., E. S		120
Whitney & Co		580
Williams & W		5
Wolf & Co	293	3,716
Wright P. & Co		3
Total	890	30,585
Corres. date, 1888	658	32,419
Old Rails.	Tons.	Tons.
Baldwin Bros. & Co		240
Bowring & A		57
Crossman & Bro		1,598
Henderson Bros		150
Neumark & Gross		6,115
Perkins, C. L		433
Perry & Ryer		177
Sheldon & Co		203
Ward & Co., J. E		21
Wolff, H		141
Total		9,105
Corres. date, 1888		5,541
Scrap Iron.	Tons.	Tons.
Bowring, A		25
Burgass & Co		162
Downing & Co		321
Funch, E. & Co		397
Henry, A. F	50	50
Neumark & Gross		500
Spaulding & Co		172
Ward & Co., J. E	130	559
Watjen, F. & Co		152
Total	180	2,338
Corres. date, 1888		1,398
Sheet Zinc.	Lbs.	Lbs.
Crooks & Co		441,814
Lemarch's S's, H		1,554
Total		443,36
Sheet Iron.	Tons.	Tons.
Coddington & Co		456
Downing & Co		16
Kelly, Hugh		5
Total		477
Corres. date, 1888	25	1,230
Charcoal Iron.	Tons.	Tons.
Bacon & Co		97
Downing & Co		671
Lilienberg N		6
Milne & Co		94
Muller, S. & Co		135
Naylor & Co		45
Page, N. & Co		754
Total		1,802
Corres. date, 1888		404
Spiegeleisen.	Tons.	Tons.
Abbott & Co		2,676
Blakely & McLellan		3,100
Crocker Bros	182	9,041
Dana & Co	500	6,226
Farris & Co		325
Geisenheimer & Co		110
Jansen, J. A		9,397
Naylor & Co	1,137	10,517
Perkins, C. L		2,601
Walbaum Bros		675
Total	1,819	44,866
Corres. date, 1888	1,066	22,899
Iron Ore.	Tons.	Tons.
Earnshaw, A		4,971
Lawrence, Johnson & Co		480
Total		5,451
Corres. date, 1888	1,022	19,817

EXPORTS.

Copper.	Pounds.	Pounds.
Abbott & Co		463,100
Amer. Metal Co		799,527
Am. & Patterson	2,500	193,750
Belmont & Co	400,000	925,000
Fyfe, Robert		100,000
Hurst, F. W. J		113,000
Naylor & Co		1,234,500
Orford, C. & S Co		112,013
Piper, D. & Co		3,898
Raftery, T. E	250,000	250,000
Seaman, Sam'l H		141,800
Total	252,500	3,926,597
Corres. date, 1888	243,633	23,424,337
Copper Matte.		
Abbott & Co		427,0[illegible]
Amer. Metal Co		3,449,[illegible]
Am. & Patterson		394,[illegible]
Clark, W. A		879,019
Cortis, R. J		240,6[illegible]
Henriott, F		5,293,[illegible]
Seaman, Sam'l H		13,[illegible]
Wil'ms, Terhune		4,63[illegible]
Total	15,	[illegible]
Corres. date, 1888	603,937	37,[illegible]
Copper Ore.		
Burgass & Co		32,[illegible]
R. J. Cortis		34,[illegible]
Total		66,500
Corres. date, 1888		181,869

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares No.	Shares Par	Assessments. Total levied.	Assessments. Date and amount of last.	Dividends. Total paid.	Dividends. Date and amount of last.
1	Adams, s. L.	Colo.	$1,500,000	150,000	$10	*	.....	$555,000 Jan., 1887 .15
2	Alice, s. C	Mont	10,000,000	400,000	25	*	.....	775,000 Dec. 1888 .06½
3	Alma Cons., G	Idah.	300,000	30,000	10	*	.....	45,000 Dec. 1888 .50
4	Alturas, G	Idah.	1,500,000	300,000	5	.....	.....	262,500 Jan. 1888 37½
5	Amy & Silversmith, s.	Mon.	.....	341,419	...	.....	.....	247,530 Aug. 1887 .12½
6	Atlantic, C	Mich	1,000,000	40,000	25	$280,000	Apl., 1878 $1.00	520,000 Feb. 1889 2.00
7	Argenta, s	Nev.	10,000,000	100,000	100	325,000	July 1888 .10	40,000 Feb. 1880 .20
8	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	*	.....	380,000 July 1889 .20
9	Aurora, L	Mich	2,000,000	100,000	20	*	.....	155,000 Oct. 1887 1.87½
10	Bassick, G. s	Colo.	10,000,000	100,000	100	*	.....	400,000 Mar. 1884 1.00
11	Belle Isle, s	Nev.	10,000,000	100,000	100	155,000	Apl. 1889 .10	300,00 De. 1887 .05
12	Belcher, G. s	Nev.	10,400,000	104,000	100	2,832,000	Feb. 1889 .50	15,397,200 Apl 1876 1.00
13	Bellevue Idaho, s. L.	Idah.	1,250,000	125,000	10	88,750	May 1889 .10	187,500 Jan 1887 10
14	Bodie Con., G. s	Cal.	10,000,000	100 000	100	550,000	Mar. 1889 .50	1,295,000 Apl. 1885 .50
15	Boston & Mont., G	Mon.	2,500,000	250,000	10	*	.....	620,000 Jun. 1886 .10
16	Boston & Mont., C.S.	Mon	2,500,000	100,000	25	*	.....	600,000 July 1889 1.00
17	Breece, S	Colo	200,000	200,000	25	*	.....	2,000 Feb. 1880 .01
18	Brooklyn Lead, L. S.	Utah	500,000	50,000	10	*	.....	127,000 July 1887 .05
19	Bulwer, G	Colo	10,000,000	100,000	10	105 000	Apr. 1889 .25	175 000 Jan. 1884 .10
20	Bunker Hill & Sull.	Idah.	3,000,000	300,000	10	*	.....	150,000 Oct. 1883 .06½
21	Caledonia, G	Dak.	10,000,000	100,000	100	505,000	May 1885 .15	112,000 July 1889 .08
22	Calumet & Hecla, C	Mich	2,500,000	100,000	25	1,200,000	....	32,350,000 July 1889 5.00
23	Carbonate Hill, s. L.	Colo.	1,500,000	200,000	10	.....	....	80,000 Apl., 1884 .05
24	Carlisle, G	N. M.	1,000,000	200,000	5	.....	....	175,000 Dec. 1888 .12½
25	Castle Creek, G	Idah.	100,000	100,000	1	.....	....	51,000 Oct., 1887 .03
26	Catalpa, s. L	Colo.	3,000,000	300,000	10	.....	....	270,000 May 1884 .10
27	Central, C	Mich	500,000	20,000	25	100,000	Sept 1861 .06	1,930,000 Feb. 1889 2.00
28	Chrysolite, s. L	Colo.	10,000,000	200,000	50	*	....	1,850,000 Dec. 1884 .25
29	Colorado Central, s. L	Colo.	2,750,000	275,000	10	*	....	406,000 July 1889 .05
30	Confidence, s. L	Nev.,	.....	24,800	...	287,440	Apl. 1887 .50	199,680 Apl. 1889 1.00
31	Cons. Cal. & Va., G. s.	Nev.	21,600,000	216,000	100	108,000	Jan. 1885 .20	3,038,800 July 1889 .50
32	Contention, s	Ariz.	12,500,000	250,000	50	.....	....	‡2,587,000 Dec. 1884 .25
33	**Cop. Queen Cons, C.	Ariz	1,400 000	140,000	10	.....	....	140,000 Oct 1888 .50
34	Crescent, s. L.	Utah	15,000,000	600,000	25	*	....	228,000 Oct. 1888 03
35	Crown Point, G. s.	Nev.,	10,000,000	100,000	100	2,875,000	July 1889 .50	11,588 000 Jan. 1875 2.00
36	Daly, s. L	Utah	3,000,000	150,000	20	.....	....	1,087,50 Jun. 1889 .25
37	Deer Creek, s. G	Idah.	1 000,000	200,000	5	*	....	20,000 Jun. 1887 .05
38	Deadwood-Terra, G	Dak.,	5,000,000	200,000	25	*	....	‡1,000,000 Nov 1887 .10
39	Derbec B. Grav., G. s.	Cal.,	10,000,000	100,000	100	90,000	Dec. 1881 .10	180.000 May 1887 .10
40	Dunkin, s. L	Colo.	5,000,000	200 000	25	*	....	380,000 July 1889 05
41	Dunstone, G. s. L	Mont	1,000,000	200,000	5	*	....	6,000 Nov 1888 .03
42	Eclipse	Colo.	100,000	100,000	1	.....	....	20,000 Nov. 1887 .10
43	Elkhorn, G. s	Mont	1,000,000	100,000	10	50,000	July 1883 .50	170,000 July 1887 .05
44	Empire L., G	Mont	500,000	100,000	5	*	....	70,500 Oct. 1887 .37½
45	Eureka Con., G. s. L.	Nev.	5,000,000	50,000	100	550,000	Jun. 1889 .50	4,955,000 July 1888 .25
46	Evening Star, s. L	Colo.	500,000	50,000	10	*	....	1,425,000 Apl 1889 .25
47	Excelsior, G	Cal.,	10,000,000	100,000	100	560,000	Sept 1885 1.00	875,000 Oct. 1886 .25
48	Father de Smet, G	Dak.,	10,000,000	100,000	100	200,000	Nov 1878 1.00	1,125,000 Dec 1883 .20
49	Franklin, C	Mich	1,000,000	40,000	25	220,000	Jun. 1871	800,00 Dec. 1888 2.00
50	Freeland, G. s.	Colo.	5,000,000	200,000	25	*	....	190,000 July 1886 .10
51	Fresno Enterprise, G	Cal.,	5,000,000	100,000	50	.....	Mch 1883 .10	10,000 July 1882 .10
52	Garfield Lt., G. s	Nev.	500,000	100,000	5	.....	....	85,000 Apl. 1888 12½
53	Golconda, G. s	Idah.	1,000,000	100,000	10	.....	....	120,000 May 1888 .60
54	Gould & Curry, G. s.	Nev.	10,800,000	108,000	100	4,402,200	May 1889 .30	926,800 Oct. 1870 10.00
55	Grand Central, s	Ariz.	1,000,000	100,000	10	.....	....	625.00 Dec 1882 .25
56	Grand Prize, s	Nev.	10,000,000	100,000	100	625,000	Mar. 1889 .30	49 000 Mar 1884 .25
57	Granite, s. L	Idah.	500,000	500,000	1	.....	....	10,000 Jan 1888 .02
58	Granite Mountain, s.	Mont	10,000,000	400,000	25	.....	....	6,700,000 Jun. 1889 .75
59	Green Mountain, G	Cal.,	1,250,000	125,000	10	.....	....	212,000 Nov. 1881 .07½
60	Hale & Norcross, G. s	Nev.,	11,200,000	112,000	100	5,086,000	July 1887 .50	1 822,000 Aug. 1888 .50
61	Hecla Con., s. G. L. C	Mont	1,500,000	30,000	50	.....	....	1,332,500 May 1889 .50
62	Hel'a Mg & Red. C. & L	Mont	3,315,000	663,000	5	*	....	197,970 July 1886 .06
63	Holmes, s	Nev.	10,000,000	100,000	100	300,000	Sept 1885 .10	75,000 Apl 1886 .25
64	Holyoke, G	Idah.	200,000	200,000	1	.....	....	27,00 Feb. 1883 .10
65	Homestake, G	Dak.,	12,500,000	125,000	100	200,000	July 1878 1.00	4,418,750 July 1889 .10
66	Honorine, s. L	Utah	500,000	250.000	2	37,500	Apl. 1889 .05	125.00 Sept 1887 .05
67	Hope, s	Mont	1,000,000	100,000	10	*	....	233,252 Apl. 1888 .25
68	Horn Silver, s. L	Utah	10,000,000	400,000	25	*	....	4,000,000 Nov. 1884 .50
69	Hubert, G	Colo.	500,000	50,000	10	*	....	259 59 Oct 1888 .11
70	Idaho, G	Cal.,	310,000	3,100	100	.....	....	5,166,150 Jun 1889 5.00
71	Ideal, s. L	Colo.	1,500,000	50,000	10	.....	....	15.000 Oct. 1886 .05
72	Illinois, s	N. M.	100,000	100,000	1	*	....	45,000 Apl 1889 .20
73	Independence, s	Nev.,	10,000,000	100,000	100	340,000	Oct. 1886 .20	225,000 Sept 1879 .25
74	Iron Hill, s	Dak.,	2,500,000	250,000	10	134,000	July 1889 .03	156,250 Nov 1887 .07½
75	Iron Silver, C. & L	Colo.	10,000,000	500,000	20	*	....	2,500,000 Apl. 1889 .20
76	Jackson, G. s	Nev	5,000,000	50.000	100	237,500	Nov 1880 .20	55,000 Jun 1889 .10
77	Jay Gould	Mont	2,000,000	40,000	5	*	....	365,000 Apl 1889 .04
78	Jocuistita, s	Mex.	2,500,000	250,000	10	.....	....	1,200,000 Feb. 1880 .50
79	Jumbo, G	Colo.	2,000,000	200,000	10	*	....	35.000 Oct. 1887 .02½
80	Kentuck	Nev.,	3,000,000	300,000	10	351,000	Apl 1889 .30	1,350,000 Dec. 1886 .10
81	La Plata, s. L	Colo	2,000,000	200,000	10	*	....	610,000 Sept 1882 .30
82	Leadville Cons., s. L.	Colo.	4,000,000	400,000	10	*	....	423,000 Apl. 1887 .05
83	Lexington, G. s	Mont	4,000,000	40,000	100	*	....	565,000 Jan. 1885 2.00
84	Little Chief, s. L	Colo.	10,000,00	200,000	50	*	....	800,000 July 1888 .10
85	Little Pittsburg, s. L	Colo.	20,000,000	200,000	100	*	....	1,050,000 Mch. 1880 .50
86	Marion Badiou, G	N.C.	500,000	.....	...	.....	....	15,000 Jan. 1886 .....
87	Martin White, s	Nev	10,000,00	100,000	100	1,175,000	Jan. 1889 25	140,000 Dec. 1886 25
88	Mary Murphy, G. s	Colo.	350,000	3,500	100	.....	....	175,000 May 1888 5.00
89	Minnesota, C	Mich	1,000,000	40,000	25	420,000	Apl. 1886 1 00	1,826,000 Mar. 1876 .....
90	Mono, G	Cal.	5,000,000	50,000	100	65,350	Mar. 1889 .25	12.500 Mar 1886 .25
91	Montana, Lt., G. s	Mont	3,300,00	660,000	5	*	....	2,272,785 July 1889 .06¼
92	Morning Star, s. L	Colo.	1,000,00	100,000	10	.....	....	775,000 Mar. 1888 .25
93	Moulton, S. G	Mont	2,000,000	200,000	10	*	....	380,000 Dec. 1887 .07½
94	Mount Pleasant, G	Cal.	150,000	150,000	1	*	....	150,000 Feb 1887 .30
95	Mt. Diablo, s	Nev.	5,000,000	50,00	100	137,500	Jun. 1880 2.00	140,000 Jan. 1889 .40
96	Napa, Q	Cal.,	700,000	100,000	7	*	....	310,000 July 1889 .10
97	Navajo, G. s	Nev.,	10,000,000	100,000	100	485,000	Apl. 1888 .30	365,000 Apl. 1889 .10
98	New Guston, s	Colo.	500,000	100,000	5	*	....	100,000 Dec. 1888 .50
99	N. Hoover Hill, G. s.	S. C.	300,000	120,000	2½	.....	....	30,000 Dec. 1885 .06¼
100	Northern Belle, s	Nev.,	5,000,000	50,000	100	425,000	Jan. 1884 8.30	2,400,000 Apl 1883 .50
101	North Belle Isle, s	Nev.,	10,000,000	100,000	100	380,000	Jan 1889 .30	230,000 May 1888 .50
102	North Star, G	Cal.,	1,000,000	100,000	10	.....	....	150,000 Dec 1888 .50
103	Ontario, s. L	Utah	15,000,000	150,000	100	.....	....	10,175,000 Jun. 1889 .50
104	Ophir, G. s	Nev.	10,000,000	100,000	100	4,159,440	May 1889 .50	4,895,800 July 1882 1.00
105	Original, S. C	Mont	1,500,000	60,000	25	*	....	123,000 July 1888 .05
106	Osceola, C	Mich	1,250,000	50,000	25	480,000	Apl. 1876 1.60	1,225,500 Mar. 1889 1 00
107	Oxford, G	N. S.	125.000	125,000	1	*	....	7450 Sept 1888 .02
108	Paradise Valley, G. s	Nev.	10,000,000	100,000	100	57,000	Apl 1888 .15	150,000 Apl 1887 .10
109	Parrot, C	Mont	1,800,000	180,000	10	.....	....	372,000 May 1889 .10
110	Peacock, S. G. C	N. M.	2,000,000	200,000	10	*	....	60.000 Nov. 1886 .....
111	Pluman Eureka, G	Cal.,	10,000,250	1400,625	10	*	....	2,495,312 Apl 1889 .50
112	Plutus, G. S. C. L	Colo,	2,000,000	200,000	10	*	....	40,500 Feb. 1886 .10
113	Plymouth Con., G	Cal.,	5,000,000	100,000	50	*	....	2,280,000 Feb. 1888 40
114	Quicksilver, pref., Q	Cal.,	4,300,000	43,000	100	.....	....	1,599,593 May 1889 1.50
115	" com., Q	Cal.,	5,700,000	57,000	100	.....	....	643,867 July 1882 .40
116	Quincy, C	Mich	1,000,000	40,000	25	200,000	Dec. 1882	5,250,000 Aug 1889 5.00
117	Richmond, S. L	Utah	1,350,000	54,000	25	*	....	4,312,587 Jun 1887 1.25
118	Ridge, C	Mich.	500,000	20,000	25	219,939	Mar 1886 .50	99,795 Feb. 1880 .50
119	Robinson Con., s. L	Colo.	10,000,000	200,000	50	*	....	585,000 Mar. 1886 .05
120	Robert E. Lee, s. L	Colo	10,000,000	500,000	20	.....	....	100,000 Dec. 1882 .50
121	Savage, s	Nev.,	11,200,00	112,000	100	6,542,000	July 1889 50	4,460,000 July 1889 3.00
122	Shoshone, G	Idah.	150,000	150,000	1	.....	....	7,500 Apl. 1883 .01
123	Sierra Buttes, G	Cal.,	2,325,000	1325,500	10	.....	....	1,568,440 Apl. 1888 .12½
124	Sierra Nevada, G. s.	Nev.,	10,000,000	100,000	100	6,200,000	Jun. 1889 .25	102,000 Jan. 1871 1.00
125	Sierra Nevada, s. L	Idaho	1,000,000	¶	1	*	....	40,000 May 18-9 .02
126	Silver Cord, G. s. L	Colo.	5,000,000	500,000	10	.....	....	275,000 Apl. 1889 .10
127	Silver King, s	Ariz.	10,000,00	100,000	100	50,000	Jun. 1888 .50	1,950,000 July 1887 .25
128	Silver Mg. of W	N. M.	500,000	500,000	1	*	....	25,000 June 1889 .05
129	Silverton, G. s. L	Colo.	2,000,000	200,000	10	*	....	50,000 Nov. 1886 .02
130	Small Hopes Cons., s	Colo.	5,000,000	250,000	20	*	....	3,137,500 Jun 1889 .10
131	Smuggler, s. L	Colo.	600,000	60,000	10	.....	....	66,700 Aug. 1883 .25
132	Spring Valley, G	Cal.,	200,000	200,000	1	50,000	Oct. 1886 .25	50.000 Jan 1881 25
133	Standard, G. s	Cal.,	10 000,00	100,000	100	25,000	Oct. 1884 .25	8,595,000 Jun. 1888 .05
134	Stormont, s	Utah	500,000	500,000	1	*	....	155,000 Nov 1881 .05
135	St. Joseph, L	Mo.,	1,500,000	150,000	10	*	....	844,000 Dec. 1887 .20
136	Surinam, G	D. G.	3,000,000	600,000	5	*	....	105,000 Nov. 1887 .05
137	Swansea, G	Colo.	600,000	60,000	10	*	....	9,000 Apl. 1888 .02½
138	Syndicate, G	Cal.,	10,000,000	100,000	100	38,729	July 1882 .15	48,308 Sept 1885 .10
139	Tamarack, C	Mich.	1,000,000	40,000	25	520,000	Apl. 1885 3.00	960,000 July 1889 3.00
140	Tip Top, s	Ariz.	10,000,000	100,000	100	250,000	Sept 1883 .25	190,000 Nov 1881 .20
141	Tombstone, G. s. L.	Ariz.	12,500,000	500,000	25	*	....	1,250,000 Apl. 1882 .10
142	United Verde, C	Ariz.	3,000,000	300,000	10	*	....	97,500 Feb. 1884 .20
143	Valencia, M	N. H.	150.000	1,500	100	*	....	37,500 Apl 1886 2.50½
144	Viola Lt., s. L	Idah	750,000	150,000	5	*	....	273,500 Oct. 1888 .37½
145	Ward Cons., s. L	Colo.	2,000,000	200,000	10	.....	....	10,000 Apl. 1889 .05
146	Yankee Girl, G	Colo	2,500,000	250,000	10	*	....	1,275,000 July 1887 .10
147	Yellow Jacket, G. s.	Nev.,	12,000,0 0	1200,000	100	5,50- 000	Mar 1889 .50	2,184,000 Aug 1871 1.50
148	Webb City, L. s	Mo.,	55,000	11,000	5	.....	....	8,300 Jun 1889 .10

NON-DIVIDEND-PAYING MINES

	Name and Location of Company.	Capital Stock.	Shares No.	Shares Par Value	Assessments. Total levied.	Assessments. Date & am't of last.
1	Agassis Cons., s. L	Colo.	$2,500,000	50,000	$50	....
2	Alloues, C	Mich	2,000,000	80,000	25	$697,000 Mar. 1889 .50
3	Alpha Con., G. s.	Nev.,	3,000,000	30,000	100	588,750 July 1889 87½
4	Alta, s	Nev.	10,080,000	100,800	100	2,248,800 Sept 1888 .50
5	Amador, G	Cal.,	400,000	200,000	2	* ....
6	American Flag, s	Colo.	1,250,000	125,000	10	300,000 Jun 1877 .5
7	Angio-Montana, Lt.	Mon.	600,000	120,000	5	....
8	Appalachian, Lt., G.	N. C.	1,500,000	300,000	5	....
9	Astoria, G	Cal.,	200,000	100,000	2	....
10	Barcelona, G	Nev.,	5,000,000	200,000	25	* ....
11	Bechtel Con., G	Cal.,	10,000,000	100,000	100	173,500 Jan. 1883 .10
12	Belmont, s	Nev.	5,000,000	50,000	100	735,000 Apl. 1886 .10
13	Best & Belcher, G. s	Nev.	10,086,000	100,800	100	2,130,190 Jun. 1889 .25
14	Big Pittsburg, s. L	Colo.	20,000,000	200,000	100	* ....
15	Bi-Metallic, s	Mon.	5,000,000	200,000	25	* ....
16	Black Oak, G	Cal.,	3,000,000	300,000	10	* ....
17	Boston Con., G	Cal.	10,000,000	100,000	100	170,000 Nov 1883 .25
18	Bremen, s	N. M	5,000,000	500,000	10	* ....
19	Brunswick, G	Cal.,	2,000,000	400,000	5	* ....
20	Bullion, G. s	Nev.,	10,000,000	100,000	100	4,007,000 Aug. 1888 .50
21	Calaveras, G	Cal.,	500,000	500,000	1	* ....
22	Carisa, G	Wy.,	500,000	100,000	5	* ....
23	Carupano, G. s. L. C	Ven.	200,000	100,000	2	* ....
24	Cashier, G. s	Colo.	500,000	250,000	2	* ....
25	Cen Contin'l, G. s. L.	C. & A	2,000,000	200,000	10	* ....
26	Charles Dickens, G. s.	Idah.,	1,250,000	250,000	5	* ....
27	Cherokee, G	Cal.	1,500,000	150,000	10	....
28	Chollar, s	Nev.,	11,200,000	112,000	100	1,484,000 July 1889 .50
29	Cleveland, T	Dak.,	1,000,000	500,000	2	* ....
30	Coichis	N.M.	500,000	500 00	10	....
31	Commonwealth, s	Nev.	10,000,000	100,000	10	170,000 Nov 1888 .50
32	Comstock, G. s.	Nev.,	10,000,000	100,000	100	30 000 Mar. 1887 .15
33	Con. Imperial, s	Nev.	5,000,000	50,000	100	4,800,000 Nov. 1888 .05
34	Con. Pacific, G	Cal.,	6,000 000	60,000	100	180,000 Fb 1889 .15
35	Cons Silver, s	Mo.,	2,500,000	250,000	10	....
36	Courtlandt	Colo.	500,000	50,000	10	....
37	Crescent, s. L	Colo.	3,000,000	300,000	10	* ....
38	Crocker, G	Cal.,	10,000,000	100,000	100	125,000 Jun. 1889 .10
39	Crowell, G	N. C.	500,000	500,000	1	* ....
40	Dahlonega, G	Ga.,	250,000	250,000	1	* ....
41	Dandy, s	Colo.	5,000,000	500,000	10	....
42	Dardanelles, G	Cal.,	1,000,000	100,000	10	....
43	Decatur, s	Colo.	1,500,000	300,000	5	* ....
44	Denver City, s. L	Colo.	5,000,000	500,000	10	* ....
45	Denver Gold, G	Col.	600,000	60,000	5	* ....
46	Durango, G	Colo.	500,000	500,000	1	* ....
47	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990.000 Mar. 1886 1.00
48	El Cristo, G. s	U.S.C	1,000,000	500,000	2	* ....
49	El Dorado, G	Cal.,	1,000,000	250,000	4	* ....
50	Emerald, G. s	U.S.C	1,000,000	500,000	2	....
51	Empire, s	Utah	10,000,000	100,000	100	* ....
52	Eureka Tunnel, s. L	Nev.,	10,000,000	100,000	100	* ....
53	Exchequer	Nev.	10,000,00	100,000	100	515,000 Apl, 1889 .25
54	Found Treasure, G. s.	Nev.,	10,000,000	100,000	100	30,500 Apl 1889 12½
55	Gogebic L. Syn., I	Wis.	5,000,000	200,000	25	....
56	Gold Flag, s	Colo.	500,000	500,000	1	* ....
57	Golden Era, s	Mon.	2 000,000	200,000	10	* ....
58	Gold Placer, G	Colo.	5,000,000	200,000	25	229,314 Dec. 1885 .25
59	Gold Rock, G	Cal.	1,000,000	500,000	2	* ....
60	Goodshaw, G	Cal.,	10,000,00	100,000	100	* ....
61	Grand Belt, C	Tex.,	12,000,00	120,000	100	....
62	Grand Duke, s	Colo.	800,000	80,000	10	* ....
63	Great Remance, G. s.	U.S.C	1,000,000	500,000	2	* ....
64	Gregory-Bobtail, G	Colo.	550,000	550,000	1	* ....
65	Gregory Con., G	Mon.	3,000,000	300,000	10	....
66	Harlem M. & M. Co, G	Cal.,	1 000 000	200,000	5	....
67	Head Cent. & Tr. s. G	Ariz.	10,000,000	100,000	100	....
68	Hecla, G	Cal.,	1,500,000	300,000	5	45,000 Jan. 1889 .15
69	Highland, G	Mich	500,000	25,000	20	....
70	Hollywood	Cal.,	200,000	100,000	2	....
71	Hortense, s	Colo.	2,000,000	200,000	2	....
72	Huron, C	Mich	1,000,000	40,000	25	280,000 May 1887 3.00
73	Iron Gold & Silver, s	N. M	2,000,000	200,000	10	* ....
74	Ironton, L	Wis.	1,000,000	400 000	25	....
75	Iroquois, L	Mich	1,250,000	50,000	25	....
76	J. D. Keymert	Ariz	10,000,000	100,000	100	....
77	Julia Cons., G. s	Nev.,	11,000,00	110,000	100	1,660,000 Jan. 1889 .10
78	Kearsarge, C	Mich	1,250,000	50,000	25	190,000 Oct. 1887 1.00
79	Lacrosse, G	Colo.	1,000,000	100,000	10	* ....
80	Lee Basin, s. L	Colo.	5,000,000	500,000	10	* ....
81	Mammoth Bar., G.	Cal.,	10,000,000	100,000	100	50,000 Dec. 1881 .....
82	May Belle, G	Cal.,	10,000,000	100,000	100	84,000 Mar. 1 84 .15
83	Mayflower Gravel	Cal.,	1,000,000	100,000	10	485,000 Jan 1889 .50
84	Medora, G	Dak.	250,000	250,000	1	....
85	Mexican, G. s	Nev.	10,000,000	100,000	100	2,775,760 July 1889 .25
86	Middle Bar G	Cal.	400,000	200,000	2	* ....
87	Mike Conner, s. L	Colo	1,000,000	200,000	5	* ....
88	Monitor, G	Colo.	100,000	100,000	1	* ....
89	Moose Silver, s	Colo	3,000,000	300,000	10	* ....
90	Mutual Mg. & Sm.	W'sh	10 0,000	100,000	1	* ....
91	Native, C	Mich	1,000,000	40,000	25	....
92	Neath, G	Colo	1,000,000	100,000	10	....
93	Nevada Queen, G. s	Nev	10,000,000	100,000	100	230,000 Jun. 1889 .50
94	New Germany, G	N. S.	100,000	100,000	1	* ....
95	New Pittsburg, s. L	Colo	2,000,000	200,000	10	* ....
96	N. Commonw'h, s	Nev.	10,000,000	100,000	100	60,000 Apl 1889 .30
97	North Standard, G	Cal.,	10,000,00	100,000	100	20,000 Nov 1888 .....
98	Noonday	Cal.,	600,000	60,000	10	208,000 Dec 1881 .10
99	Oneida Chief, s	Mi.	600,000	125,0	100	* ....
100	Oriental & Miller, s	Nev.,	10,000,000	400,000	25	....
101	Osceola, G	Nev.,	5,000,000	50,000	100	* ....
102	Overman, G. s	Nev.	11,520,00	115,20	100	3,765,860 Jan. 1889 .25
103	Park, s	Utah	2,000,000	200,000	10	....
104	Peer, s	Ariz.	10,000,000	100,000	100	145,000 Jan 1889 .10
105	Phanix,	Ariz.	500,000	500,000	100	370,000 Mar 1889 .25
106	Phœnix, G. s	Ark.	5,000,000	200,000	25	....
107	Phœnix Lead, s. L	Colo.	100,000	100,000	1	* ....
108	Pilgrim, G	Cal.,	600,000	300,000	2	* ....
109	Potosi, s	Nev.	11,200,00	112,000	100	1,406,600 Apl, 1889 .50
110	Prosatis, G	Utah	250,000	250,000	1	* ....
111	Puritan, s. G	Colo.	1,500,000	150,000	10	* ....
112	Quincy	Colo.	3,000,000	300,000	10	* ....
113	Rappahannock, G. s.	Va.,	250,000	250,000	1	* ....
114	Red Elephant, s	Colo.	500,000	500,000	1	* ....
115	Ropes, G. s	Mich	2,000,000	80,000	25	103,200 July 1887 .50
116	Rubicon, G	N. C.	1,500,000	300,000	5	....
117	Sampson, G. s. L	Utah	10,000,000	100,000	100	288,157 July 1888 1.00
118	San Sebastian, G	San S	1,600,000	320,000	5	....
119	Santa Fe, C	N. M.	5,000,000	500,000	10	* ....
120

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 20.		July 22.		July 23		July 24		July 25		July 26		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alice, Mont	....	....	....	....	****	....	....	....	....	....	1.15	....	800
Argenta, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Aspen Mg & S, Colo	....	....	0.25	....	....	....	....	....	....	....	....	....	50
Atlantic, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Belcher, Nev	3.10	....	....	....	....	....	....	....	....	....	....	....	200
Belle Isle, Nev	....	....	....	....	....	....	....	....	....	....	25	....	300
Bodie Cons., Cal	....	....	....	....	....	....	1.20	....	....	....	1.25	....	600
Breece	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bulwer, Cal	.36	....	....	....	....	....	.33	....	....	....	.30	....	900
Caledonia, Dak	....	....	....	....	3.00	....	....	....	....	....	....	....	100
Calumet & Hecla	....	....	....	....	....	....	....	....	....	....	....	....	.....
Challar, Nev	1.50	....	....	....	....	....	1.60	....	....	....	1.45	....	500
Chrysolite	....	....	....	....	....	....	....	....	....	....	....	....	.....
Colorado Cent'l, Colo	....	....	....	....	1.50	....	....	....	....	....	....	....	100
Cons. Cal. & Va., Nev	7.35	....	7.13	....	....	....	7.25	....	....	....	7.25	....	765
Crown Point, Nev	2.30	....	....	....	2.30	....	2.25	....	....	....	2.25	....	550
Deadwood	....	....	....	....	....	....	....	....	....	....	1.55	....	200
Dunkin	....	....	....	....	....	....	....	....	....	....	.95	....	300
Father de Smet, Dak	....	....	....	....	....	....	....	....	....	....	....	....	.....
Frank in, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Gould & Curry, Nev	2.00	....	....	....	....	....	2.15	....	....	....	2.0	....	500
Grand Prize, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Homestake, Dak	3.10	....	....	....	....	....	3.15	....	....	....	3.15	....	400
Holyoke, Id	....	....	....	....	....	....	....	....	....	....	....	....	.....
Homestake, Dak	....	....	....	....	....	....	....	....	....	....	....	....	.....
Horn-Silver, Ut	....	....	....	....	....	....	....	....	....	....	1.10	1.05	500
Iron Hill, Dak	....	....	....	....	....	....	....	....	....	....	.50	....	100
Iron Silver, Colo	....	....	....	....	....	....	....	....	....	....	2.00	....	500
Ladville Co., Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Little Chief, Colo	....	....	....	....	....	....	....	....	....	....	.35	....	200
Little Pittsburg, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mono, Cal	1.00	....	....	....	....	....	....	....	.85	....	....	....	200
Moulton, Mont	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mount Diablo, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Navajo, Nev	....	....	....	....	....	....	.50	.45	....	....	.40	....	1,100
North Belle Isle, Nev	1.10	....	....	....	....	....	1.35	....	....	....	....	....	400
North Star, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Ontario, Ut	....	....	....	....	....	....	....	....	....	....	35.25	....	10
Omair, Nev	....	....	....	....	....	....	4.75	....	....	....	.50	....	450
Osceola, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Plutus, Colo	....	....	.82	....	.80	....	.79	....	....	....	.82	....	1,300
Plymouth, Cal	....	....	....	....	....	....	....	....	6.75	....	7.25	....	150
Quicksilver Pref., Cal	35.00	....	37.00	....	....	....	....	....	....	....	....	....	50
" Com., Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Quincy, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Robinson Cons. Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Savage, Nev	1.80	....	....	....	....	....	1.80	....	....	....	1.75	....	700
Sierra Nevada, Nev	....	....	....	....	....	....	2.50	....	....	....	2.35	....	500
Silver King, Ariz	....	....	1.00	....	1.00	.79	1.00	.82	1.05	.85	1.00	.96	1,995
Silver Mg. of L. V	....	....	....	....	....	....	....	....	....	....	....	....	.....
Standard	....	....	....	....	....	....	....	....	....	....	9	....	100
Ward Con	1.40	1.30	1.45	1.35	1.60	1.45	1.60	1.50	1.60	1.55	1.75	1.70	9,600
Yellow Jacket	3.01	....	....	....	....	....	....	....	....	....	2.90	....	400

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 20.		July 22.		July 23.		July 24.		July 25.		July 26.		SALES.
	H.	L.	H.	L.	H.	L.	H	L.	H.	L.	H.	L.	
Allouez, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Alta, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Amador, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
American Flag, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Astoria, Cal	.20	....	.20	....	.20	....	.20	....	.20	....	.20	....	2,600
Barcelona, Nev	....	....	....	....	....	....	....	....	....	....	....	....	200
Best & Belcher, Nev	....	....	....	....	....	....	3.65	....	....	....	3.60	....	400
Brunswick, Cal	....	....	....	....	....	....	....	....	.06	....	....	....	200
Buffalo Iron Min'g	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bullion, Nev	.70	....	....	....	....	....	....	....	.80	....	.70	....	1,900
Cashier, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Castle Creek, Id	....	....	....	....	....	....	....	....	....	....	....	....	.....
Colchis, N. M	....	....	....	....	....	....	6.00	....	....	....	....	....	100
Commonw'th, Nev	4.25	....	....	....	....	....	....	....	....	....	....	....	200
Con. Imperial, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Con. Pacific, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Denver City, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Eastern Oregon	....	....	....	....	....	....	....	....	....	....	....	....	.....
El Cristo, Rep of Col	....	....	....	....	....	....	1.25	1.20	1.20	1.10	1.15	....	1,300
Excelsior, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Exchequer Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hector, Cal	....	....	....	....	....	....	....	....	70	....	....	....	250
Julia, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Kingst'n & Pemb'ke	....	....	....	....	....	....	....	....	.50	....	....	....	300
Kossuth, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lacrosse, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lee Basin, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mexican, Nev	3.10	....	....	....	3.00	....	3.00	....	....	....	3.00	2.95	1,400
Middle Bar, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Monitor, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mutual Sm. & M. Co	1.40	....	1.45	....	1.50	....	1.50	....	....	....	1.50	....	1,500
Nevada Queen, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
N. Com'n w'th, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Occidental, Nev	2.40	2.35	....	....	2.10	....	1.9	....	....	....	2.25	....	1,100
Oriental & Mil., Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Phœnix of Ariz	....	....	....	....	....	....	....	....	....	....	....	....	.....
Potosi, Nev	....	....	....	....	....	....	1.60	....	....	....	1.75	....	250
Rappahann'k, Va	.07	.07	.07	.06	.06	....	....	.06	....	....	....	....	7,800
S. Sebastian, San S	....	....	....	....	....	....	....	....	....	....	.50	....	119
Scorpion, Nev	.33	....	....	....	....	....	.45	....	....	....	....	....	400
Shoshone Idaho	....	....	....	....	....	....	....	.06	....	.06	....	....	3,500
Silver Cord	....	....	.60	....	....	....	....	....	....	....	....	....	500
Silver Hill, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Queen	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sullivan Con	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sutro Tunnel, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
" Trust Cert.	....	....	....	....	.58	.50	.55	.54	.57	....	....	....	7,080
Tornado, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Union Cons., Nev	....	....	3.00	....	....	....	3.00	....	....	....	3.00	....	650
United Copper	1.05	....	1.10	....	1.05	....	....	....	....	....	1.05	....	1,600
Utah, Nev	....	....	.90	....	....	....	....	....	....	....	....	....	200
....	....	....	....	....	....	....	....	....	....	....	....	....	.....
....	....	....	....	....	....	....	....	....	....	....	....	....	.....

*Ex. dividend. †Dealt in at the New York Stok Ex. Unlisted securities. ‡Assessment unpaid. Dividend shares sold, 24 720. Non-dividend shares sold, 32,449. Total New York, 57,169.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	July 19.		July 21.		July 22.		July 23		July 24.		July 25.		SALES.
Atlantic, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bodie, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bonanza Development	....	....	....	....	....	....	....	....	....	....	....	....	.....
Bost. & Mont., Mont	36.00	37.75	36.50	....	36.00	3.63	36.00	....	36.50	35.5	36.00	35.88	1,213
Breece, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Calumet & Hecla, Mich	208	.. —	208	....	208	....	208	207	208	....	2 8	....	193
Catalpa, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Central, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Chrysolite, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Con. Cal & Va., Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Dunkin, Colo	....	....	....	....	1.00	....	1 00	....	1.00	.97½	1.00	....	2,100
Enterprise	....	....	....	....	....	....	....	....	....	....	....	....	.....
Franklin, Mich	....	....	9 00	....	....	....	....	....	....	....	....	....	50
Hale & Norcross, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Honorine, Utah	....	....	....	....	....	....	....	....	....	....	....	....	.....
Little Chief, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Little Pittsburg, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Martin White, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Mono, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Napa, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Ontario, Utah	....	....	....	....	....	....	....	....	....	....	....	....	.....
Osceola, Mich	....	....	....	....	....	....	8.50	....	....	....	....	....	50
Pewabic, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Quincy, Mich	50 00	49.00	....	....	....	....	....	....	....	....	....	....	16
Ridge, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sierra Nev., Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver King, Ariz	....	....	....	....	....	....	....	....	....	....	....	....	.....
Standard, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Tamarack, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....

NAME OF COMPANY.	July 19.		July 20.		July 22.		July 23		July 24.		July 25.		SALES.
Allouez, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Arnold, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Aztec, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Brunswick, Cal	....	....	....	....	....	....	....	....	....	....	....	....	.....
Butte & Bost., Mont	....	....	....	....	....	....	....	....	....	....	....	....	.....
Canada	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cashier, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Crescent, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Denver City, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
El Cristo, Rep of Col	....	....	....	....	....	....	....	....	....	....	....	....	.....
Everett, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hanover, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Humboldt, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hungarian	....	....	....	....	....	....	....	....	....	....	....	....	.....
Huron, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Kearsarge, Mich	....	....	....	....	....	....	....	....	....	....	5 00	....	341
Mesnard, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
National, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Native, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Pontiac, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Rappahannock, Va	....	....	....	....	....	....	....	....	....	....	....	....	.....
Rockland	....	....	....	....	....	....	....	....	....	....	....	....	.....
Santa Fe, N. Mex	....	....	....	....	.53	.50	....	....	.50	....	.60	....	3,200
Security, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Shoshone Idaho	....	....	....	....	....	....	....	....	....	....	....	....	.....
South Side, Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
St. Louis Cop., Mich	....	....	....	....	....	....	....	....	....	....	....	....	.....
Sullivan, Dak	....	....	....	....	....	....	....	....	....	....	....	....	.....

Boston: Dividend shares sold, 3,622. Non-dividend shares sold, 3,541. Total Boston, 7,163.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	July 20.		July 22.		July 23.		July 24.		July 25.		July 26.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cambria Iron	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal & Iron Co	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ches. & O. RR	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chic. & Ind. Coal RR	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. & Hocking Coal	100	.....	.....	17	.....	.....	.....	.....	.....	.....	15	.....	.....	1,058
Col., C. & I	100	.....	.....	.....	.....	28¼	28	28¾	28½	.....	.....	.....	.....	270
Consol. Coal	100	.....	.....	.....	.....	.....	.....	25	.....	.....	.....	.....	.....	100
Del. & H. C	100	143⅞	143½	.....	.....	144¼	143¾	.....	.....	144⅛	144⅝	144⅝	.....	771
D., L. & W. RR	50	143⅝	143⅛	143⅜	142⅝	143⅝	143	141	142⅞	143⅜	14 5⅝	144⅜	143½	31,540
Hocking Valley	100	13¾	12	.....	.....	14½	11¼	14	13¾	14	13½	14⅜	14⅛	14,460
Hunt. & Broad Top	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref	.....	.....	.....	.....	.....	.....	.....	45¾	.....	.....	.....	.....	.....	6
Lehigh C. & N	50	.....	.....	52⅜	.....	52⅞	.....	.....	.....	.....	.....	.....	.....	180
Lehigh & W. B. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lehigh Valley RR	50	53	.....	53¼	53	53	52⅞	53¼	53	.....	.....	.....	.....	1,418
Marshall Con. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mahoning Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	100	.....	.....	.....	.....	.....	.....	154	.....	.....	.....	.....	.....	60
New Central Coal	50	.....	.....	.....	.....	7½	7⅛	.....	.....	.....	.....	.....	.....	200
N. J. C. RR	100	.....	.....	110	109½	110⅞	110	111¼	111	111	110	111	110½	3,783
N. Y. & S. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., Susq. & Western	100	.....	.....	7¾	.....	.....	.....	.....	.....	8	7⅞	.....	.....	540
Do. pref	100	.....	.....	32½	.....	.....	.....	.....	.....	32	.....	.....	.....	300
N. Y. & Perry C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk & Western R.R	50	.....	.....	14¼	.....	.....	.....	.....	.....	15	.....	15	.....	650
Do. pref	50	.....	.....	50¼	.....	50¾	.....	51	.....	50½	.....	.....	.....	1,200
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR	50	51⅜	51¼	51½	50½	51⅛	51⅜	51⅛	51⅜	.....	.....	.....	.....	1.759
Ph. & R. RR.**	.....	44⅛	44⅛	44⅜	43⅝	45¼	44⅛	45½	43¾	44⅛	43¾	44⅝	43⅞	196,734
Sunday Creek Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee C. & I. Co	.....	39½	39¼	39¾	39¼	39⅞	.....	39⅞	.....	39⅝	39	39¾	39½	4,200
Do. pref	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Westmoreland Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

**Of the sales of this stock, 44,489 were in Philadelphia, and 152,245 in New York. Total sales, 263,159.

San Francisco Mining Stock Quotations.

COMPANY	CLOSING QUOTATIONS. July 19.	July 20.	July 22.	July 23.	July 24.	July 25.
Alpha	.....	.....	.....	.....	.....	.....
Alta	1 45	1.45	1.30	.....	.....	1.30
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle	.....	.....	.....	.....	.....	.....
Best & Bel	3.70	3.65	3.55	3.55	3.60	3.50
Bodie	1.40	.....	.....	.....	1.20	1.15
Bulwer	.....	.....	.....	.....	.....	.....
Challar	1.45	.....	1.45	1.50	1.55	1.40
C'm'weal'h	4.25	4.05	3.95	.....	4.15	4.00
Con. C. & V	7.13	7.00	7.00	7.00	7.00	7.25
Con. Pac	.....	.....	.....	.....	.....	.....
Crown Pt	2.15	.....	2.15	2 10	2.10	2.10
Eureka C	.....	1.30	.....	.....	.....	.....
Gould & C	2.10	2.10	2.05	2.00	2.10	.....
Grd. Prize	.....	.....	.....	.....	.....	.....
Hale & N	.....	3.00	3.00	2.95	2.00	3.00
M. White	.....	.....	.....	.....	.....	.....
Mexican	3.00	2.95	2.90	2.90	2.90	2.85
Mono	.....	.....	.....	.....	.90	.60
Mt. Diablo	.....	.....	.....	.....	.....	.....
Navajo	.....	.40	.....	.40	.....	.....
Nev. Queen	1.45	1.30	1.30	.....	1.30	1.25
N. Belle I	1.00	1.00	2 10	.95	.95	.95
Occidental	2.30	2.30	..	1.90	2.00	2.30
Ophir	4.75	4.75	4.65	4.60	4.70	4.60
Potosi	.....	1.60	1.55	1.40	1.60	1.55
Savage	1.70	1.70	1.65	1 65	1.75	.....
Sierra Nev	2.25	2 30	.....	2.30	2 30	.....
Union Con	3.00	3.00	2.90	2.90	3.00	2.90
Utah	.80	.....	.....	.....	.75	.75
Yellow Jkt	2 80	3 00	.....	2.80	.....	.....

STOCK MARKET QUOTATIONS

Baltimore, Md.

COMPANY.	Bid.	Asked.
Atlantic Coal	1.00	1.50
Balt. & N. C.	.20	.25
Conrad Hill		.15
Cons. Coal	.22	.26
Diamond Tunnel	.35	.50
George's Crk. C.	1.06	1.10
North State (Balt.)	.20	.25
Silver Valley	.45	1.00

Prices bid and asked during the week ending July 25th.

Birmingham, Ala.

COMPANY.	Bid.	Asked.
Ala. R. Mill Co.	....	$60
Ala. Con. C. & C. Co.	....	$30
*Alice Furnace	$102	....
Anna Howe G. Mg. Co.	$⅜	$⅝
Bess. Land Co.	$22½@$22⅝	$23
Bir. Fur. & Mg.	...	$14½
Bir. Mg. & M g.	....	$144
Broken Arrow	$3	$3¾
De Bardeleben C. & I. Co.	$50	$55
Decat. L. Imp.	$9½@$9⅝	....
Decatur Min. L.	....	$50
Enterprise Mtg.	....	$35
*Eureka	....	$105
Hen. S. & M. Co.	$70	$70½
Jagger Towley C. & C.	....	$11@$11⅛
Mag-Ellen	$96	....
*Mary Pratt	....	....
Sloss I. & S.	$42¼	$43¼
†Sloss I. & S.	$9½	....
††Sloss I. & S.	$65	$63½
Tuscal oose C., I. & L. Co	$20	....
Tenn. C. & I. Co.	$39⅜	$40
*Williamson	....	....
Woodstock I. Co	$58@$58¼	$59¼@$59½

Prices bid and asked during week ending July 22d.

* Bonds. † First mortgage. †† Second mortgage.

Kansas City. July 23.

Company.	Par value.	Bid.	Asked.
Burch, L. & Z., Mo.	$ 1	$0.15	$...
Ida Hill, S., N. Mex.	100	90.00	100.00
K. C., Colo.	....	....	1.00
Kentucky, Z., Mo.	1	....	.10
La Motte, Mo.	100	98.00	100.00
Maverick, S., Colo.	10	9.70	10.00
Minnequa Zinc	....	....	....
Sonora, G. & S., Mex.	10	1.00	1.02
Standard, S. S., Colo.	....	10.00	....
Templar, N. Mex.	1	.10	.15
Webb City, L. Z., Mo.	5	5.50	....
Wichita, L. Z., Kan.	100	....	40.00
Granite	....	....	..

Pittsburg, Pa.

COMPANY.	H.	L.	Closing
Bridgewater Gas Co.	45.00	43.00	43.00
Charlotte Mg. Co.	2.00	2.00	2.00
Chartiers Val. Gas	50.00	47.50	49.00
La Noria Mining	2.25	1.75	2.00
Nat. Gas Co. of W. Va	68.25	67.00	68.25
Penn. Gas Co.	15.25	14.50	14.50
People's N. G. & P. Co.	17.75	17.75	17.75
Philadelphia Co.	37.00	36.50	37.00
Silverton Mg. Co.	1.00	.50	.50
Tuna Oil	68.00	68.00	68.00
Washington	80.00	80 00	80.00
Wh'ouse A. B. Co.	117.00	115.00	117 00
Wh'ouse E. Light	*50.00	*49.00	49.88
Wheeling Gas	31.00	29.00	29.50
Yankee Girl	1.00	1.00	1.00

Sales during the week ending July 25;

La Noria	1,275 shs.	$1.88@$2.13
Philadelphia Co.	663 "	36.75@37.00
Washington Oil	10 "	80.00
West. Electric	10 "	49.50
Nat. Gas' o., of W. Va.	74 "	68.00

* Actual selling price. †Ex-dividend.

St. Louis. July 24.

CLOSING PRICES.

	Bid.	Asked.
Adams, Colo.	$ .27½	....
Anderson, Mont.	....	$ .15
Arizona	.03½	.10
Aztec, N. Mex.	.41½	.45
Bi-Metallic, Mont.	....	....
Black Oak, Cal.	.25	.28¾
Black Spar	.02	.02½
Bremen, N. Mex	....	....
Buckskin	....	.05
Carriboo, Idaho	.03	.05
Central Silver	.33¾	.37½
Cleveland, Colo.	....	....
Cleveland, Idaho	.40	.45
Concepcion, Mex.	.00½	.02
Dinero, Colo.	....	....
Golden Era, Mont.	.40	.41½
Golden King	.36¼	.41¼
Golden West	.60	.80
Gold Run	.01	.02
Granite Mountain, Mont.	....	....
Hope, Mont.	....	....
Ingram	....	....
Iron Clad, N. M.	.17½	.30
Ivanhoe, Colo.	.37½	.40
I. X. L., Colo.	.17½	.18¾
Jumbo, Colo.	.01	.02
Keystone	.01	.04
La Union	.03	.04
Little Giant	.10	.11
Mary Foster, Colo.	....	....
Major Budd, Mont.	.30	.31½
Mexican Imp., Mex.	.37½	.38¾
Montrose Placer	.60	....
Mountain Key	1.25	1.35
Mountain Lion	.32½	....
Neath, Colo.	.12	.15
Old Colony	.16¼	....
Pat Murphy, Colo.	.18¾	.20
Phillips, Colo.	.60	....
Pine Grove, Idaho	.47½	.48¾
Queen of the West, Idaho	.15	.18¾
Raspberry, Mont.	....	.50
Rena	....	....
San Francisco, Mont.	.20	.22½
San Pedro	.17½	.18¾
Small Hopes, Colo.	1.30	1.45
Silver Age, Colo.	4.00	5.00
Silver Bell	.15	.20
Tourtelotte, Colo.	.36¼	.37½
West Granite, Mont.	.86¼	.88¾
Wire Patch	....	.20
Yuma, Ariz.	.28¾	.33¾

Auction Sales of Stocks.

The following securities were sold at public auction in New York last week:

50 shares Julien Electric Traction Company, $100 each $11

30 shares the American Pneumatic Tool Co., $10 each ..... per share 4.25

50 shares Retsof Mining Company, preferred 211

$10,000 Norfolk & Western R. R. Clinch Valley Equipment 5s 92½

$20,000 Delaware & Hudson Canal Company, first mortgage 7 per cent. registered bonds, due January, 1891 ..... 104¾

$20,000 Lehigh & Wilkesbarre Coal Company, 7 per cent. consolidated mortgage bonds, assented, due June 1, 1900 ..... 183¾

Electric Stocks. July 26.

The following closing quotations are reported to-day by J. Heron Crosman, New York City:

Stocks.	Par value.	Market price.
Brush	$ 50	$65 @ $85
" Illuminating	100	70 @ 75
Daft	100	45 @ 55
Consolidated	100	60 @ 61
Edison	100	185 @ 190
" Illuminating	100	90 @ 95
Julien	100	20
" Traction	9	@ 12
United States	100	50 @ 60
" " Illuminating	100	50 @ 60
Westinghouse	50	45 @ 49½
Thomson-Houston	..	....
Thomson-Hous. Welding Co.	..	....

Trust Stocks. July 26.

The following closing quotations are reported to-day by C. I. Hudson & Co., members New York Stock Exchange:

American Cotton Oil Certificates	$52¾@$53	
Cattle Trust "	16 @ 17	
Distillers' & Cattle Feeders' Certificates	42½@ 43	
Linseed Oil Certificates	@ 55	
National Lead "	23¾@ 24	
Natural Gas "	110 @120	
Standard Oil "	169 @170½	
Sugar Refineries Certificates	108¾@109¼	

During the week ending July 26th the following sales were made at the New York Stock Exchange:

	Sales.	Price H.	Price L.
Am. Cattle Trust	225	16½	15½
American Cotton Oil Certificates	24,557	53⅞	52¼
Cattle Feeders' Trust	3,000	43	42¾
National Lead Trust	67,172	24⅝	23
Sugar Trust	29,823	109¾	105½

Foreign Quotations.

COMPANY.	London. Highest.	July 13. Lowest
Alturas Gold, Idaho	....	....
Arizona Copper, Ariz.	18s. 6d.	18s.
Callao Bis, Venz	5s.	4s.
Carlisle, N. Mex	3s.	2s.
Colorado United, Colo.	....	....
Columbian, S A	....	....
Comstock, Utah	....	....
Cons. Esmeralda, Nev.	2s. 6d.	1s. 6d.
Denver Gold, Colo.	2s.	1s. 6d.
Dickens Custer, Idaho.	2s. 6J.	3s. 6d.
Eberhardt, Nev	....	....
El Callao, Venezuela	£3½	£3
Elmore, Idaho	....	....
Empire, Mont	£2-6	£1-6
Flagstaff, Utah	1s. 3d.	9d.
Garfield, Nev	6s.	5s.
Hambley Freehold, N.C.	....	....
Ilex, Cal	£⅜	£⅛
Jay Hawk, Mont	....	....
Josephine, Cal	9s.	7s.
Kohinoor, Colo.	3s.	2s.
Mason & Barry, Port.	£6¼	£5⅞
Montana Lt., Mont	£1¾	£1⅝
New California, Colo.	..	....
New Consolidated	....	....
New Emma, S., Utah	4s.	3s.
New Hoover Hill, N. C.	....	....
New La Plata, Colo.	2s. 6d.	1s. 6d.
Old Lout, Colo.	....	....
Pittsburg Cons., Nev.	11s. 3d.	8s. 9d.
Quebrada, Venezuela	....	....
Richmond Con., Nev.	£2	£1⅛
Ruby & Dunderberg, Nev	....	....
Russell Gold, N. C.	2s. 6d.	1s. 6d.
Sierra Buttes, Cal.	£11-16	£9-16
Stanly, N. C	4s.	2s.
United Mexican, Mex.	£7-16	£5-16
U. S. Placer, Colo.	5s.	4s.
Viola Lt., Idaho	2s. 6d.	1s. 6d
Paris.		July 11.
Belmez, Spain	550.00	550.00
Boleo, Mex	365.00	365.00
Callao Bis, Venez	4.00	4.00
East Oregon, Ore.	49.00	49 00
Forest Hill Divide, Cal.	300.00	300.00
Golden River, Cal.	390.00	390.00
" " parts	60.00	60.00
Lexington, Mont.	142.50	142.50
" parts	4.50	4.50
Ouray, Colo	28.00	28.00
Rio Tinto, Spain	278.75	278 75
Tharsis, Spain	88.00	88.00

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, ℔ 100 lbs. $2.00
Muriatic, 18°, ℔ 100 lbs 1.10@1.20
Muriatic, 20°, ℔ 100 lbs 1.35@1.50
Nitric, 36°, ℔ 100 lbs 4.00@5.50
Nitric, 42°, ℔ 100 lbs 5.50@7.00
Oxalic ℔ 100 lbs .9.50@10.50
Sulphuric, 60°, ℔ 100 lbs. 90@95
Sulphuric, 66°, ℔ 100 lbs 95@1.25
Alkali—36 p. c. 1.20 @1.25
Refined, 48 p. c 1.22½@1.25
Refined, 58° 1.15@1.20
Alum—Lump, ℔ lb. 1¾
Ground, ℔ lb. 1¾@2
Lump. ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ ton £4 10
Aqua Ammonia—18°, ℔ lb. 4¾
20°, ℔ lb. 6
22°, ℔ lb. 6@7
26°, ℔ lb. 10@11
Ammonia—Sul., ℔ 100 lbs. 3.12½
Carb., per lb. 7½@8½
Muriate per lb. 6½@8
Arsenic—White, powdered, ℔ lb. 3@3½
Red. ℔ lb. 7@8
White, at Plymouth, ℔ ton. £12 2 6d.
Asbestos—Am., p. ton $50@$300
Italian, p. ton, c. i. f. L'pool £18@£60
Asphaltum—P. ton 13.00
Prime Cuban. ℔ lb. 4½@5½c.
Hard Cuban, ℔ ton $28.00
Trinidad, refined, ℔ ton $30.00
Barytes—Sulph., Am. prime white 16@20
Sulph., foreign, floated, p. ton 20@21
Sulph., off color, p. ton 13.00
Carb., lump, f.o.b. L'pool, ton £6
No. 1, casks, Runcorn " £4 10 0
No 2, bags, Runcorn " " 3 15 0
Bleach—Over 35 p.c., ℔ lb.
Borax—℔ lb 9¼
Refined at Liverpool, ℔ ton £29
Brimstone—*See Sulphur.*
Bromine—℔ lb. 37@38
Chalk—℔ ton 3.25@3.50
Precipitated, ℔ lb. 4¾@5
China Clay—English, ℔ ton 13.50@18.50
Southern, ℔ ton 13.50
Chrome Yellow—℔ lb. 10@25
Cobalt—Oxide, ℔ lb. 2.60@2.90
Copper—Sulph. English Wks., ton £24
Precip., Eng. Wks, unit. fluctuating
Copperas—Common, ℔ 100 lbs. 52½@57½
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks £1 15s.
Cream of Tartar—Am. 99% 23
Powdered, 99 p c. 24½
Emery—Grain, ℔ lb. 4½@5
Flour, ℔ lb 3¾@3½
Feldspar—Ground, ℔ ton 15.00
Fuller's Earth—Lump, ℔ bbl. .90@95
Powdered, ℔ lb. 1¾@2
Gypsum—Calcined, ℔ bbl. 1.25
Iodine—Resublimed 3.50
Kainit—℔ ton 9.75@11.00
Kaolin—*See China Clay.*
Lead—Red, ℔ lb. 6¾@7
White, American, in oil, ℔ lb 6¾@7¼
White, English, ℔ lb 8¼@8¾
Acetate, or sugar of 12@13
Lime Acetate—Amer. Brown .95@1.00
" Gray 1.75@1.87½
Litharge—Powdered, ℔ lb. 6¼@6¾
English flake, ℔ lb. 9@9½
Magnesite—Greek, ℔ ton 20.00
Manganese—Crude, per unit .23@.28
Oxide, ground, per lb 2½@6½
Mercuric-Chloride—(*Corrosive Sublimate*) ℔ lb. 67@69
Mineral Wool—℔ lb. 2
Mica—In sheets according to size, 1st quality, ℔ lb. .25@$6 00
Ochre—Yellow, "B. F.," ℔ ton, f.o.b. mill 30.00
"J. F. L. S.," ℔ lb. ex dock 2½
Phosphate Rock—S. Carolina, per ton, o. b. Charleston 5.50@6.65
Ground, ex vessel New York 11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton 16.00
Phosphorus—℔ lb. 70@75
Plumbago—Ceylon, ℔ lb. 4@5
American. ℔ lb. 5@7
Potassium—Cyanide, ℔ lb. .39@40
Bromide, ℔ lb. 33
Chlorate, ℔ lb. 13¾@15½
Carb. ℔ lb. 4.70@5.50
Caustic, ℔ lb. 7½@8
Iodide .2.70@2.75
Muriate, ℔ 100 lbs. 1.80
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb 11½@12
Sulphate, ℔ 100 lbs. 2.30@2.35
Yellow Prussiate, ℔ lb. 17½@18
Red Prussiate, ℔ lb. 45@45
Pumice Stone—Select lumps, lb. 3¼
Original cks., ℔ lb. 1¾
Powdered, pure, ℔ lb. 2¼@2½
Pyrites—Non-cupreous, p. units 10d
Quartz—Ground, ℔ ton. 16.00
Rotten Stone—Powdere 3¼@3½
Lump, ℔ lb 6@
Eng., powdered, ℔ ton. £41
Lump, ℔ ton £5
Salt—Liverpool, ground ℔ sack. 75@80
Turk's Island, ℔ bush .25@27
Salt Cake—℔ lb. 62½@65
Saltpeter—Crude, ℔ lb. 5½@5½
Refined, ℔ lb. 6@8
Soda Ash—Carb., 48 ℔ 100 lb. 1.22½@1.30
Caustic, 48 ℔ 1.25
Soda Caustic, 60% 2 40
" " 70% 2.22½
" " 74-6% 2.22½
Sal, English, ℔ 100 lbs. .90
Sal, American, ℔ 100 lbs .80
Nitrate, 100 lbs. 1.95
Strontium—Nitrate ℔ lb. 9@9½
Sulphur—Roll, ℔ lb. 1¾
Flour, ℔ lb 2
Crude Brimstone, 2s., ℔ ton. 19.50
Crude Brimstone, 3ds, ℔ ton. 19.00
Talc—Ground French, ℔ lb. 1¾@1½
Domestic, ℔ lb 1@1½
c. i. f. Liverpool, ℔ ton. £4 5
Vermillion—American, ℔ lb. 61
English, ℔ lb. 82@85
Vitriol—(Blue), Ordinary, ℔ lb. 5¾@6½
Extra, ℔ lb. 7
Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 6@6½
Paris, Red Seal, ℔ lb. 6½@7
* Spot

THE RARER METALS.

Aluminum—(Metallic), ℔ lb.	$4.00
Sheet, per lb.	6.00@8.00
Arsenic—Metallic, per lb.	20
Barium—(Metallic), per lb.	975.00
Bismuth—(Metallic), per lb.	2.40
Cadmium—(Metallic), per lb.	1.25
Calcium—(Metallic), per oz.	150.00
Cerium—(Metallic), per oz.	160.00
Chromium—(Metallic), per lb.	200.00
Cobalt—(Metallic), per lb.	6.00
Didymium—(Metallic), per oz.	160.00
Erbium—(Metallic), per oz.	140.00
Gallium—(Metallic), per oz.	3250.00
Glucinum—(Metallic) per oz.	250.00
Indium—(Metallic), per oz.	158.00
Iridium—(Metallic), per lb.	650.00
Lanthanum—(Metallic), per oz.	175.00
Lithium—(Metallic), per oz.	160.00
Magnesium—Per lb.	4.50
Manganese—Metallic, per lb.	1.10
Chem. pure, per oz.	10.00
Molybdenum—(Metallic), per oz.	6.00
Niobium—(Metallic), per oz.	128.00
Osmium—(Metallic), per lb.	640.00
Palladium—(Metallic), per lb.	400.00
Platinum—(Metallic), per lb.	140.00
Potassium—Metallic, per lb.	28.00
Rhodium—(Metallic), per lb.	512.00
Ruthenium—(Metallic), per oz.	112.00
Rubidium—(Metallic), per oz.	200.00
Selenium—(Metallic), per oz.	3.00
Sodium—(Metallic) per lb.	2.75
Strontium—(Metallic), per oz.	128.00
Tantallum—(Metallic) per oz.	144.00
Telurium—(Metallic) per oz.	9.00
Thallium—(Metallic) per oz.	3.00
Titanium—(Metallic) per oz.	32.00
Thorium—(Metallic) per oz.	272.00
Tungsten—(Metallic) per oz.	4.00
Vanadium—(Metallic), per oz.	320.00
Yttrium—(Metallic), per oz	144.00
Zirconium—(Metallic), per oz.	240.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000	3.25@3.75
Jerseys, ℔ 1,000	4.75@5.25
Up Rivers, ℔ 1000	5.25@5.75
Haverstraw seconds, ℔ 1000	5.75@6.00
Haverstraw firsts ℔ 1,000	6.00@6.75
Fronts, nominal, ℔ 1000.	
Croton	14.00@16.00
Wilmington	20.00@21.00
Philadelphia	@22.00
Trenton	@22.00
Baltimore	
Building Stone—Amherst freestone, ℔ cu. ft.	95@1.00
Brownstone, ℔ cu. ft.	1.00@1.35
Granite, rough, ℔ cu. ft.	45@1.25
Granite, Scotch ℔ cu ft.	1.00@1.15
Cement—Rosendale, ℔ bbl	.95@1.10
Portland, American, ℔ bbl.	2 15@2.45
Portland, foreign, ℔ bbl.	2 30@2.40
Portland, " special brands.	2.45@3.75
Roman, ℔ bbl.	2.65@2.85
Keene's coarse, ℔ bbl.	4.50@5.50
Keene's fine, ℔ bbl.	7.00@8.25
Slate—Purple and green roofing, ℔ 100 ft.	
Red roofing, ℔ 100 sq. ft.	10.00@15.00
Black, roofing, ℔ 100 sq. ft.	4.50@5.25
Lime—Rockland, common ℔ bbl.	1.00
Rockland, finishing, ℔ bbl.	1.20
St. John, com. and finish, ℔ bbl.	.90@.95
Glens Falls, com. and fin., ℔ bbl	.85@1.10
Labor—Ordinary, ℔ day	1.50@2.00
Masons, ℔ day	4.00
Plasterers, ℔ day	4.00
Carpenters, ℔ day	3.50
Plumbers, ℔ day	3.50
Painters, ℔ day	2.50@3.50
Stonesetters, ℔ day	3.50@4.00
Tilelayers, ℔ day	3.50@4.50
Bricklayers, ℔ day	4 00

THE ENGINEERING AND MINING JOURNAL will thank any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.